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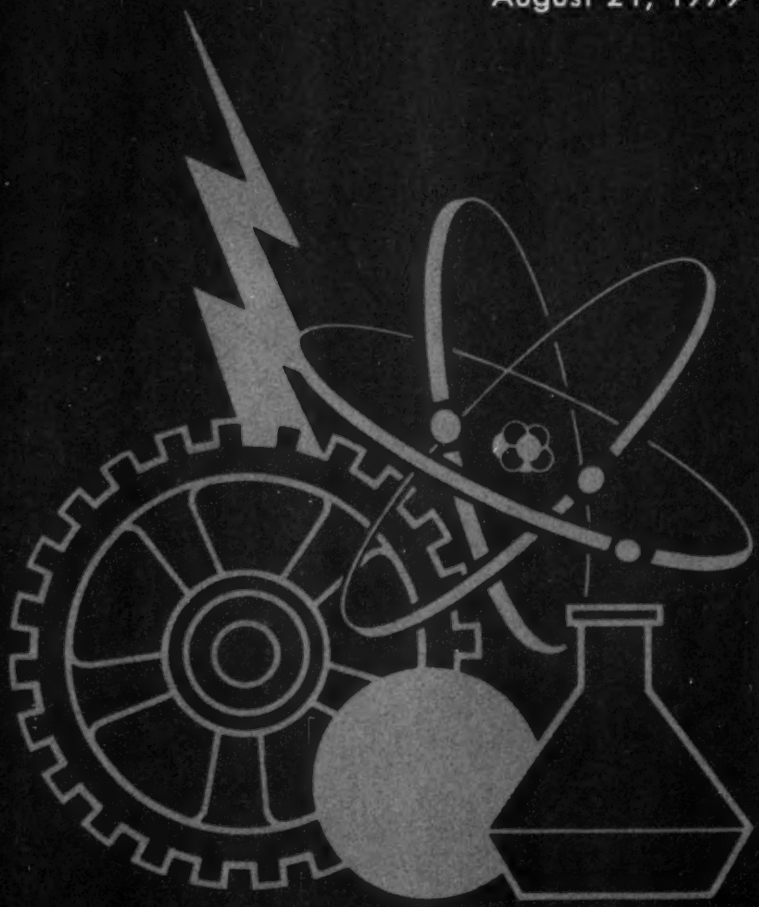
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 21, 1979



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 21, 1979 Volume 985 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $32.10 additional; single copies $1.70 each.

GENERAL INFORMATION concerning TRADEMARKS, price $1.50 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
July 3, 1979. *Acting Commissioner of Patents and Trademarks.*

Correction of Interference Rule

37 CFR §1.217

The revised text of 37 CFR § 1.217 relating to "Contents of the preliminary statement; invention made abroad," published in the OFFICIAL GAZETTE of August 1, 1978, 973 O.G. 19, contains an error in subparagraph (1). In the second sentence of subparagraph (1), the phrase "signed or sworn to" should read "signed and sworn to."

Notice of this correction was published in the Federal Register of December 11, 1978, 43 FR 57886, and was inadvertently not published in the OFFICIAL GAZETTE.

RENE D. TEGTMEYER,
July 19, 1979. *Acting Commissioner of Patents and Trademarks.*

Public Advisory Committee for Trademark Affairs

Notice of Open Meeting

In accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92-463), announcement is made of the following Committee meeting.

The Public Advisory Committee for Trademark Affairs will meet from 9:30 a.m. until 4:30 p.m. on September 6, 1979 at the Watergate Hotel, 2650 Virginia Avenue, NW., Washington, D.C., 20037, in the Potomac Room.

The Committee was established in 1970 to advise the Patent and Trademark Office on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the government in the field. The agenda for the meeting is as follows:

(1) Introductory Remarks
(2) Resource Problems
(3) Goals of Trademark Operation
(4) Quality of Office Actions
(5) Filing Increases
(6) Separating Trademark Mail
(7) Use of Paralegals in the Trademark Operation
(8) TRT Implementing Legislation and its Potential Effect on the Trademark Examining Operation
(9) Proposed Trademark Rules Changes
(10) Renewal of Committee Charter

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first come, first served basis. If time permits, oral comments by the public of 3 minutes on each topic within the above agenda will be allowed. To insure proper consideration at the meeting, any comments or suggestions relating to the agenda items should be submitted in writing before August 30. Further comments and suggestions will be accepted after the meeting on any of the matters discussed.

Copies of the minutes will be available upon request. Inquiries may be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Please mark all correspondence to the attention of Committee Control Officer, Patricia M. Davis, Office of Trademark Program Control, Room CP3-11C17. Telephone: 703-557-3881.

RENE D. TEGTMEYER,
July 27, 1979. *Acting Commissioner of Patents and Trademarks.*

Approved: July 27, 1979.
FRANCIS W. WOLEK,
Acting Assistant Secretary for Science and Technology.

Survey of Public Interest in Obtaining Classification Definitions in Microfiche

The Patent and Trademark Office is planning to offer patent "Classification Definitions" in microfiche for sale to the public through the Superintendent of Documents. Paper copies will continue to be available through the Patent and Trademark Office. Publication of this important and voluminous series of documents in such a microform will make it available at considerably less than the price now charged for the paper edition. Moreover, much of the work involved in maintaining the paper edition in current condition to reflect changes made by Classification Orders will be eliminated for subscribers to the microfiche edition.

Purpose of the Survey

The purpose of this survey is to determine (1) whether there is sufficient market interest to justify such an offering, and (2) how the definitions should be offered to best serve buyers; i.e., whether to offer them in complete sets by subscription, including updates over a period of time, or as individual items only.

Description of the Classification Definitions Microfiche

A Classification Definition microfiche is a sheet of film measuring 4" x 6" which has a capacity for recording 98 pages of information at a page size reduction of 24 to 1. Images are of the negative appearing type in a diazo film.

An entire set of Classification Definitions consisting of about 320 separate publications (one for each class) would be contained in an estimated 360 microfiche, as some of the publications are of such length as to require more than one microfiche.

The first microfiche edition of the Classification Definitions will incorporate all current and outstanding addenda into the definitions either by direct entry into the text or through annotations which direct the reader to the proper addenda. For some of the definitions, this will eliminate the need for referring to the addenda documents and, for those changes which are too voluminous to enter in the body of the definition, the annotations will facilitate reference to the separate addenda.

After initial publication of the entire set of Classification Definitions, further publication will occur about quarterly to offer definitions of new classes resulting from reclassification effort in the Patent and Trademark Office, and updated definitions which incorporate changes contained in newly published addenda. It is estimated that each quarterly update will consist of a mix of from 150 to 175 new or republished Classification Definitions. The republished definitions are intended to entirely replace earlier edition definitions.

Prices can only be estimated at this time. However, it is expected that a full set of the initial edition of Classification Definitions in microfiche and three following quarterly sets of new and updated (replacement) definitions in microfiche would be offered for sale at approximately $170. This contrasts with the price of a full set of publications in paper, without updates, of about $830. Prices for individual Classification Definitions in microfiche, if offered, are expected to be lower than for paper copies as well.

Survey Questions

If you or your organization are interested in obtaining the Classification Definitions in microfiche, please write to Mrs.

Sarah Wilson of the staff of the Superintendent of Documents at the address given below to express that interest. In your letter, please address the following questions:

(1) Which of the following best describes you (or your organization)?
- (a) Individual
- (b) Law Firm
- (c) Corporate patent department
- (d) Foreign government or institution
- (e) Other—please specify

(2) How will you or your organization prefer to purchase Classification Definitions in microfiche?

(a) Subscribe to full set and all updates within one year, and on an annual basis thereafter (a multi-year subscription is an additional possibility).

You will receive in the initial shipment, a complete set of (the first edition of) the Classification Definitions on microfiche. Thereafter, on a quarterly basis for the balance of the year (or subscription, whichever is later), you will receive new microfiche for all class definitions which have been reclassified or updated and for newly created classes.

(b) Purchase only those microfiche selected from periodically published lists of newly announced or updated definitions.

As new definitions are prepared or old ones changed through publication of new addenda, their publication will be announced in the OFFICIAL GAZETTE. Customers will order the desired definitions in microfiche as individual items. No subscriptions or "standing orders" could be accepted. Costs per unit of individually ordered microfiche will be somewhat higher than for subscriptions to sets.

(3) If you prefer the second choice in item (2) above, approximately how many definitions would you expect to purchase each year? Remember that the "average" definition will be updated in some way about twice annually.

Representatives of government depository libraries are requested not to respond to this survey, as they will be canvassed separately and directly by the Government Printing Office.

Please send your replies by Sept. 21, 1979 to:

Mrs. Sarah Wilson
Chief, Subscription Section
Documents Control Branch SSMC
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20401

ALFRED C. MARMOR,
July 23, 1979. *Administrator for Documentation.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,381,086, Re. S.N. 039,286, Filed May 15, 1979, Cl. 358/128, REPRODUCTION OF TELEVISION SIGNALS FROM PHOTOGRAPHIC DISC RECORDINGS, Dean L. Demoss, Owner of Record: *Minnesota Mining and Manufacturing Company, St. Paul, Minn.,* Attorney or Agent: Cruzan Alexander, Ex. Gp.: 233

4,019,371, Re. S.N. 041,028, Filed May 21, 1979, Cl. 73/46, APPARATUS AND METHOD FOR EXTERNALLY TESTING CONDUIT CONNECTIONS, Gervase M. Chaplin, et al., Owner of Record: *Exxon Production Research Co., Houston, Tex.,* Attorney or Agent: J. S. Schneider, Ex. Gp.: 224

4,025,895, Re. S.N. 041,542, Filed May 23, 1979, Cl. 340/3 R, NAVIGATION SYSTEM FOR MANEUVERING A STRUCTURE ABOUT A SUBMERGED OBJECT, Harry H. Shatto, Owner of Record: *Santa Fe International Corporation, Orange, Calif.,* Attorney or Agent: Robert E. Leblanc, Ex. Gp.: 222

4,055,962, Re. S.N. 045,118, Filed Jun. 4, 1979, Cl. 62/102, HYDROGEN-HYDRIDE ABSORPTION SYSTEMS AND METHODS FOR REFRIGERATION AND MEAT PUMP CYCLES, Lynn E. Terry, Owner of Record: *Inventor,* Attorney or Agent: Francis J. Mulligan Jr., Ex. Gp.: 344

4,073,445, Re. S.N. 044,266, Filed May 31, 1979, Cl. 241/101.7, FEEDER CRUSHER, David Clonch, Owner of Record: *S & S Corporation, Cedar Bluff, Va.,* Attorney or Agent: R. J. Falkowski, Ex. Gp.: 322

4,080,950, Re. S.N. 043,480, Filed May 29, 1979, Cl. 124/1, BALL THROWING DEVICE, John K. Paulson, et al., Owner of Record: *Inventor,* Attorney or Agent: M. H. Hartwell Jr., Ex. Gp.: 334

4,081,217, Re. S.N. 042,069, Filed May 24, 1979, Cl. 401/131, FOLDABLE PEN, Michael C. Klaber, Owner of Record: *Inventor,* Attorney or Agent: Henri J. A. Charmasson, Ex. Gp.: 337

4,115,215, Re. S.N. 040,155, Filed May 17, 1979, Cl. 240/67, ALUMINUM PURIFICATION, Subodh K. Das, et al., Owner of Record: *Aluminum Company of America, Pittsburgh, Pa.,* Attorney or Agent: Andrew Alexander, Ex. Gp.: 114

PATENT NOTICES

Certificates of Correction for the Week of Aug. 21, 1979

D. 251,502	4,132,634	4,146,489	4,150,978
3,960,961	4,134,112	4,146,657	4,151,148
4,011,373	4,134,954	4,146,699	4,151,327
4,088,486	4,137,695	4,147,085	4,151,702
4,092,594	4,138,385	4,147,512	4,152,008
4,094,308	4,139,741	4,147,720	4,152,154
4,112,030	4,141,887	4,148,771	4,152,348
4,112,080	4,142,920	4,148,835	4,152,739
4,114,608	4,143,066	4,149,745	4,153,145
4,115,232	4,143,727	4,150,052	4,154,644
4,116,212	4,144,580	4,150,104	4,155,076
4,122,465	4,145,522	4,150,107	4,155,183
4,122,492	4,145,714	4,150,237	4,156,132
4,123,123	4,145,741	4,150,285	4,156,207
4,126,476	4,146,029	4,150,382	4,156,801
4,130,646	4,146,088	4,150,726	
4,132,338	4,146,246	4,150,766	

Disclaimers

3,231,107.—*Milton Clar*, Silver Spring, Md. APPARATUS FOR THE COMPACTION AND DISPOSAL OF REFUSE. Patent dated Jan. 25, 1966. Disclaimer filed Mar. 15, 1979, by the assignee, *Flinchbaugh Products, Inc.*

The term of this patent subsequent to Nov. 21, 1978, has been disclaimed.

3,819,153.—*George H. Hurst*, Huntingdon Valley and *James P. Hobbins*, Philadelphia, Pa. RESCUE TOOL. Patent dated June 25, 1974. Disclaimer filed June 8, 1979, by the assignee, *Hurst Performance, Inc.*

Hereby enters this disclaimer to claims 1–4, 11–16, 18, 20 and 23–29 of said patent.

4,108,840.—*Charles B. Friedlander*, Glenshaw, Pa. UREA-URETHANE-ACRYLATE RADIATION CURABLE COATING COMPOSITIONS AND METHODS OF MAKING SAME. Patent dated Aug. 22, 1978. Disclaimer filed June 13, 1979, by the assignee, *PPG Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 6, 7, 9, 12, 14, 16, 17, 20, 21 and 23 of said patent.

4,153,708.—*Wolfgang Krämer, Karl Heinz Büchel*, and *Manfred Plempel*, Wuppertal, Germany. ACYLATED IMIDAZOLYL-O,N-ACETALS, THEIR PHARMACEUTICALLY ACCEPTABLE SALTS AND METAL COMPLEXES. Patent dated May 8, 1979. Disclaimer filed June 6, 1979, by the assignee, *Bayer Aktiengesellschaft*.

The term of this patent subsequent to Jan. 16, 1996, has been disclaimed.

Disclaimer and Dedication

4,146,064.—*John Farrell Hughes*, Southampton, and *John Michael Charles Roberts*, Camberley, England. METHOD OF REDUCING THE FLAMMABILITY HAZARD OF HYDROCARBON AEROSOLS. Patent dated Mar. 27, 1979. Disclaimer and Dedication filed May 23, 1979, by the assignee, *S. C. Johnson & Son, Inc.*

Hereby disclaims and dedicates the entire term of said patent to the Public.

Patents Available for Licensing or Sale

D. 247,777. HOUSING FOR AUDIO-VISUAL ENTERTAINMENT SYSTEM OR SIMILAR ARTICLE. Donald Roberson, 1801 East 12th St., Cleveland, Ohio 44114.

3,314,080. HUMIDIFYING SYSTEM. John Shilling, Jr., 16126 Spinning Ave., Torrance, Calif. 90504.

3,575,773. LIGHT REFLECTIVE DEVICE. L. B. Courtot, 5050 SOM Center Road, #308–2, Willoughby, Ohio 44094.

3,858,612. FLOOR DRAIN STOPPER. Arthur Van Steenburg, R. R. Box 9384, Spirit Lake, Iowa 51360.

3,882,824. GROOMING HORSES. W. F. Young, Incorporated, P.O. Box 14, Springfield, Mass. 01101.

3,927,709. OVERHEAD GARAGE DOOR. Wilbur R. Anderson, 2405 Nichol Ave., Anderson, Ind. 46011.

4,021,872. MATERNITY MATTRESS. Lee V. Powell, 4534 White Pine, Memphis, Tenn. 38109.

4,066,431. SYNTHETIC N-RELEASING SOIL CONDITIONER. Dr. D. M. Ennis, 13205 Court Ridge Road, Midlothian, Va. 23113.

4,072,337. TRAILER CONSTRUCTION. Joseph K. Barker, Correspondence to: Nathaniel A. Humphries, 1730 Rhode Island Ave., NW., Washington, D.C. 20036.

4,078,643. TOKEN OPERATED CONTROL SYSTEM FOR A MULTITRACK TAPE CARTRIDGE PLAYER. David Benjamin Warthan, 668 E French Camp Road, French Camp, Calif. 95231.

4,150,624. BULLET IDENTIFICATION MEANS. Michael D. Hammond, 16 Dumbarton Oaks Place, Elgin, Ill. 60120.

The following three patents are offered by Silent Sentry Inc., P.O. Box 230, Springfield, Mo. 65801.

3,805,501. HEDGE TRIMMING CART.

3,968,337. DOOR ACTIVATED INTRUDER ALARM SWITCH.

4,060,704. DOOR ACTIVATED INTRUDER ALARM SWITCH.

General Foods Corporation is prepared to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Applications for licenses should be addressed to: Chief Patent Counsel, General Foods Corporation, 250 North St., White Plains, N.Y. 10625.

3,373,042. PROCESS FOR CONTINUOUSLY FREEZING COFFEE EXTRACT.

3,482,990. FREEZE-DRYING OF FOAMED AROMATIC MATERIAL.

3,619,204. PREPARATION OF PARTICULATE MATTER FOR FREEZE DRYING.

3,637,398. PREPARATION OF PARTICULATE MATTER FOR FREEZE DRYING.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

Re. 30,015. IMAGE DISPLAY EMPLOYING FILTER COATED PHOSPHOR PARTICLES.

4,152,045. OPTICAL WAVEGUIDE WITH PRISM COUPLER FOR PARALLEL LIGHT.

4,152,641. METHOD AND APPARATUS FOR THE DETERMINATION OF SIGNAL PICKUP QUALITIES OF A STYLUS OF A CAPACITIVE DISC VIDEO PLAYER.

4,153,343. LIQUID CRYSTAL DYESTUFFS AND ELECTRO-OPTIC DEVICES INCORPORATING SAME.

4,153,741. METHOD FOR FORMING A SURFACE RELIEF PATTERN IN A POLY (OLEFIN SULFONE) LAYER.

4,153,856. PROXIMITY FOCUSED ELEMENT SCALE IMAGE DISPLAY DEVICE.

4,153,862. SELF-REGULATING DEFLECTION CIRCUIT WITH RESISTIVE DIODE BIASING.

4,155,055. WAVE DEVICE HAVING A REVERSE DOMAIN GRATING.

4,155,076. CCD GRAY-TO-BINARY CODE GENERATOR.

4,155,098. GROOVE DEPTH ESTIMATION SYSTEM USING DIFFRACTIVE GROOVE EFFECTS.

4,155,618. BASE ASSEMBLY FOR AN ELECTRON TUBE.

4,155,627. COLOR DIFFRACTIVE SUBTRACTIVE FILTER MASTER RECORDING COMPRISING A PLURALITY OF SUPERPOSED TWO-LEVEL RELIEF PATTERNS ON THE SURFACE OF A SUBSTRATE.

4,155,633. CORRECTIVE OPTICAL DEVICE FOR HOMONYMOUS HEMIANOPSIA.

4,156,243. PARABOLOID REFLECTOR ANTENNA.

4,156,248. GATE TURN-OFF SEMICONDUCTOR CONTROLLED RECTIFIER DEVICE WITH HIGHLY DOPED BUFFER REGION PORTION.

4,156,264. HIGH POWER PROTECTION APPARATUS.

4,156,826. MERCURY ARC LAMPS.

4,156,850. DISPLAY SYSTEM FOR FACILITATING THE SETUP OF A TUNING SYSTEM.

4,156,855. PHASE-LOCKED LOOP WITH VARIABLE GAIN AND BANDWIDTH.

4,156,940. MEMORY ARRAY WITH BIAS VOLTAGE GENERATOR.

The following patents are available for licensing at a reasonable royalty rate. Please direct all correspondence to: Patent Counsel, Texasgulf, Inc., High Ridge Park, Stamford, Conn. 06904.

3,191,783. GRANULAR PRODUCT STORAGE.

3,199,955. PROCESS OF REDUCING SULFUR DIOXIDE TO ELEMENTAL SULFUR.

3,332,744. RADIOMETRIC METHOD FOR PLANT STEAM CONTROL IN POTASH AND PHOSPHATE RECOVERY PROCESS.

3,427,145. METHOD OF AGGLOMERATING POTASSIUM CHLORIDE USING HYDROFLUORIC ACID OR METALLIC FLUORIDE.

3,442,553. SLURRY MINING OF CORNALLITE.

3,455,647. PROCESS FOR PRODUCING SODIUM SESQUICARBONATE AND SODA ASH FROM TRONA.

3,512,941. APPARATUS FOR PRODUCING NORMAL SULFURPHOSPHATE.

3,537,589. OUTSIDE DRIVE FOR A TILTING PAN FILTER.

3,595,624. METHOD AND APPARATUS FOR WASHING CRYSTALLIZERS.

3,655,538. PROCESS FOR ELECTROWINNING ZINC FROM SULFIDE CONCENTRATES.

3,674,442. CONTROL OF ORGANIC DEPOSITION IN SLURRY HEATERS IN POTASH CRYSTALLIZER CIRCUIT.

3,807,141. APPARATUS FOR REDUCING THE HYDROGEN SULPHIDE AND HYDROGEN POLYSULFIDE CONTENT OF LIQUID SULFUR.

3,810,542. PROCESS FOR REMOVING CHROMIUM FROM COOLING TOWER BLOWDOWN STREAMS.

3,920,424. LIQUID SULFUR GAS SCRUBBER APPARATUS.

3,989,607. SOLVENT EXTRACTION AND ELECTROWINNING OF ZINC AND COPPER FROM SULFATE SOLUTION.

4,049,514. ZINC HYDROMETALLURGICAL PROCESS.

4,063,933. PROCESS FOR THE TREATMENT OF COMPLEX LEAD-ZINC CONCENTRATES.

4,083,034. PROCESS FOR OBTAINING PURE ORTHOPHOSPHORIC ACID FROM SUPERPHOSPHORIC ACID.

4,158,043. PROCESS FOR PRODUCING SODA ASH FROM NATURAL ALKALI METAL CARBONATE-CONTAINING ORES.

The General Electric Company is prepared to grant nonexclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Application for license may be addressed to Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

3,142,976. AUTOMATIC WASHING MACHINE WITH IMPROVED CYCLE SELECTION MEANS.

3,362,082. AUTOMATIC DRYER CONTROL SYSTEM.

3,713,376. AIR-CONDITIONER AIR-DIRECTING MEANS.

4,023,419. MECHANISM FOR COIN-OPERATED TIMER RUN TIME ACCUMULATOR.

4,134,092. HEAT ACTIVATABLE ELECTRICAL SWITCH.

4,146,330. OPTICAL METHOD AND APPARATUS FOR SURFACE ROUGHNESS EVALUATION.

4,147,070. AUTOMATIC BELT TIGHTENER.

4,150,280. HIGH EFFICIENCY FREE EXPANSION FOIL HEATING ELEMENT.

4,151,681. ARRANGEMENT FOR MOUNTING HINGE PIN SOCKETS TO CABINET DOORS.

4,153,228. SELF-TIGHTENING CLAMP.

Application for license may be addressed to: General Electric Company, Re-Entry and Environmental Systems Division. 3198 Chestnut St., Philadelphia, Pa. 19101.

4,152,120. COAL DESULFURIZATION USING ALKALI METAL OR ALKALINE EARTH COMPOUNDS AND ELECTROMAGNETIC IRRADIATION.

Applications for license may be addressed to Manager, Patent Administration and Licensing, Electric Power Research Institute, P.O. Box 10412, Palo Alto, Calif. 94303.

4,103,646. APPARATUS AND METHOD FOR COMBUSTING CARBONACEOUS FUELS EMPLOYING IN TANDEM A FAST BED BOILER AND A SLOW BOILER.

4,115,929. GAS DISTRIBUTOR FOR FLUIDIZING BEDS.

4,023,921. OIL BURNER FOR NOX EMISSION CONTROL.

4,108,615. VANED ANODE FOR HIGH INTENSITY STAGE OF ELECTROSTATIC PRECIPITATOR.

4,021,328. REACTOR FOR SOLVENT REFINED COAL AND METHOD.

4,094,615. BLADE ATTACHMENT STRUCTURE FOR GAS TURBINE ROTOR.

4,142,831. DIMPLED COOLING PASSAGES FOR WATER COOLING A GAS TURBINE BUCKET.

4,090,810. PIN-FINNED COOLING PASSAGES FOR WATER COOLING A GAS TURBINE BUCKET.

4,093,399. TURBINE ROTOR WITH CERAMIC BLADES.

4,084,922. TURBINE ROTOR WITH PIN MOUNTED CERAMIC TURBINE BLADES.

4,113,242. RELEASABLE HIGH PRESSURE SEAL AND METHOD OF FORMING SAME.

4,058,396. RECOVERY OF LEAD FOR BATTERIES.

4,049,885. CONSTRUCTION FOR SOLID ELECTROLYTE IN SODIUM/SULFUR BATTERY.

4,053,689. CONTACT BETWEEN METAL CAN AND CARBON/GRAPHITE FIBERS IN SODIUM/SULFUR CELLS.

4,070,527. EFFICIENT SODIUM/SULFUR BATTERY.

3,359,022. METHOD FOR PRODUCING SODIUM-BETA-ALUMINA SOLID ELECTROLYTES.

4,012,562. MODULAR ELECTRICAL ENERGY STORAGE DEVICE.

4,048,390. NA/S CELL REACTANT CONTAINER WITH METAL ALUMINIDE COATING.

3,925,098. POSITIVE ELECTRODE FOR ELECTRICAL ENERGY STORAGE DEVICE.

4,146,683. SODIUM SULFUR CELL CONSTRUCTION AND METHOD.

4,110,516. SODIUM-SULFUR CELL CASINGS.

4,140,841. SULFUR ELECTRODE-SULFUR ELECTRODE CONTAINER AND METHODS OF MANUFACTURE.

4,102,175. RESPONSE TIME VERIFICATION OF IN SITU HYDRAULIC PRESSURE SENSORS IN A NUCLEAR REACTOR.

4,127,035. ELECTROMAGNETIC TRANSDUCER.

4,030,347. BIAXIAL CAPACITANCE STRAIN TRANSDUCER.

4,120,752. FUEL PELLET FOR FUEL PIN OF NUCLEAR REACTOR CORE.

4,125,742. TIERED CONVOLUTED SHIELDED INSULATORS.

4,078,304. CUTTER FOR CORRUGATED PIPE FOR FLEXIBLE GAS INSULATED TRANSMISSION LINE.

4,063,355. CUTTER FOR HELICALLY CORRUGATED TUBE FOR FLEXIBLE GAS INSULATED CABLE.

4,091,230. EVAPORATION COOLED TRANSMISSION LINE SYSTEM.

4,110,551. EXTRUDED SHEATH SECTION FOR COMPRESSED GAS INSULATED TRANSMISSION LINES.

4,119,793. IMPROVED TRANSMISSION LINE BREAKDOWN VOLTAGE.

4,053,338. METHOD OF FABRICATING COMPRESSED INSULATED CABLE.

4,100,367. MULTIPLE PART INSULATOR FOR FLEXIBLE GAS-INSULATED TRANSMISSION LINE CABLE.

4,122,298. OFFSET CONSTANT THICKNESS WEB FOR INSULATOR SUPPORT DISK.

4,056,679. SODIUM FILLED FLEXIBLE TRANSMISSION CABLE.

4,101,730. TERMINATION FOR STRANDED CABLE.

4,097,682. MEANS FOR PROTECTING UNDERGROUND ELECTRICAL EQUIPMENT FROM THERMAL RUNAWAY.

4,140,337. HERMETIC QUICK CONNECTION AND SEAL FOR COUPLING LOW PRESSURE SYSTEMS.

4,126,808. HIGH VOLTAGE TWO STAGE TRIGGERED VACUUM GAP.

4,086,645. REPULSION COIL ACTUATOR FOR HIGH SPEED HIGH POWER CIRCUITS.

4,058,373. COMBUSTIBLE GAS-IN-OIL DETECTOR.

4,079,403. THYRISTOR DEVICE WITH SELF-PROTECTION AGAINST BREAKOVER TURN-ON FAILURE.

4,126,825. ELECTRONIC CURRENT TRANSDUCER FOR HIGH VOLTAGE TRANSMISSION LINES.

4,087,701. TRANSFORMER CASCADE FOR POWERING ELECTRONICS ON HIGH VOLTAGE TRANSMISSION LINES.

4,029,892. METHOD AND MEANS FOR TRAPPING PARTICLES IN ENCLOSED HIGH VOLTAGE ELECTRIC BUS APPARATUS.

4,029,890. PARTICLE TRAPPING ELBOW JOINT FOR ENCLOSED HIGH VOLTAGE ELECTRIC BUS APPARATUS.

4,029,891. PARTICLE TRAPPING SHEATH COUPLING FOR ENCLOSED ELECTRIC BUS APPARATUS.

4,054,835. RAPID RESPONSE GENERATING VOLTMETERS.

4,082,933. STAB CONNECTOR FOR ENCLOSED ELECTRIC BUS APPARATUS.

4,095,205. TRANSFORMER WITH IMPROVED INSULATOR.

4,117,525. OVERPRESSURE PROTECTION FOR VAPORIZATION COOLED ELECTRICAL APPARATUS.

4,145,679. VAPORIZATION COOLED AND INSULATED ELECTRICAL APPARATUS.

4,129,845. VAPORIZATION COOLED ELECTRICAL APPARATUS.

4,117,441. CURRENT LIMITING FUSE CONSTRUCTION AND METHOD.

4,109,228. CURRENT LIMITING FUSE WITH RESINOUS ARC-QUENCHING FILLER.

4,117,357. FLEXIBLE COUPLING FOR ROTOR ELEMENTS OF A SUPERCONDUCTING GENERATOR.

4,120,169. MULTIPHASIC PUMP FOR ROTATING CRYOGENIC MACHINERY.

4,092,555. SLIDING SUPPORT FOR A SUPERCONDUCTING GENERATOR ROTOR.

4,151,433. SPIRAL PANCAKE WINDING FOR TWO-POLE ELECTRICAL MACHINE SPECIFICALLY TURBINE GENERATOR.

4,096,403. IMPROVED SUPERCONDUCTING HYBRID MAGNETIC FLUX PUMP.

4,112,705. FUEL FIRED SUPPLEMENTARY HEATER FOR HEAT PUMP.

4,042,012. HEAT PUMP SYSTEM AND IMPROVED HEAT TRANSFER.

4,137,798. TWO-SPEED DRIVE APPARATUS.

4,094,165. VARIABLE SPEED DRIVE UNIT FOR COMPRESSION OF HEAT PUMP.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW.
Washington, D.C. 20324

Patent 4,126,862. Countermeasure for LORO Radar. Filed Apr. 23, 1968. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,130,011. Flared Sonic End Nozzle Velocity Coupling Test Burner. Filed June 14, 1977. Patented Dec. 19, 1978. Not available NTIS.

Patent 4,130,872. Method and System of Controlling a Jet Engine for Avoiding Engine Surge. Filed Oct. 10, 1975. Patented Dec. 19, 1978. Not available NTIS.

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U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

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Patent 4,087,920. Two-Fluid Tiltmeter. Filed Mar. 25, 1977. Patented May 9, 1978. Not available NTIS.

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

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Patent application 6-006,149. FiberOptic Acoustic Sensor. Filed Jan. 24, 1979.

Patent application 965,760. Covert Recovery or Signalling System. Filed Dec. 4, 1978.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP-2, Washington, D.C. 20546

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Patent 4,135,817. Apparatus for Measuring an Aircraft's Speed and Height. Filed Mar. 9, 1978. Patented Jan. 23, 1979. Not available NTIS.

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U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

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U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP-2, Washington, D.C. 20546

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

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Patent 4,140,002. Impact Sound Stressing Holding Assembly. Filed May 2, 1978. Patented Feb. 20, 1979. Not available NTIS.

Patent 3,986,138. Isothermal Gas Dynamic Laser Nozzle. Filed Mar. 29, 1974. Patented Oct. 12, 1976.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

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Patent 4,110,004. Complex Photodichroic Spatial Filter. Filed Jan. 12, 1977. Patented Aug. 29, 1978. Not available NTIS.

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Patent 4,125,837. Dual Notch Fed Electric Microstrip Dipole Antennas. Filed Oct. 6, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,125,838. Dual Asymmetrically Fed Electric Microstrip Dipole Antennas. Filed Oct. 6, 1977. Patented Nov. 14, 1978. Not available NTIS.

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Patent 4,134,426. Seawater Hydraulic Motor Distributing Valve Based on a Hydrosphere Bearing. Filed Feb. 7, 1978. Patented Jan. 16, 1979. Not available NTIS.

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Patent 4,138,660. Automated Flash-Bang Method and Apparatus for Determining Lightning Stroke Distances. Filed Sept. 14, 1977. Patented Feb. 6, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP-2, Washington, D.C. 20546

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Patent 4,137,365. Oxygen Post-Treatment of Plastic Surface Coated With Plasma Polymerized Silicon-Containing Monomers. Filed Mar. 21, 1977. Patented Jan. 30, 1979. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 28, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-8-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-18-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	10-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	6-21-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-19-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	4-10-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-12-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-7-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-31-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-21-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-25-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-9-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-16-78

Expiration of patents: The patents within the range of numbers indicated below expire during July 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,041,614 to 3,047,872, inclusive
Plant Patents..... Numbers 2,155 to 2,159, inclusive

REISSUES

AUGUST 21, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

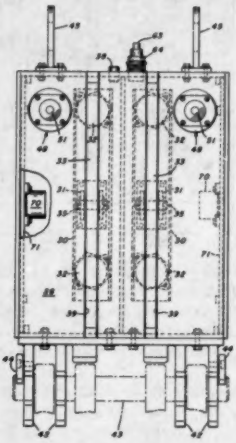
Re. 30,075
METHOD AND APPARATUS FOR LOCATING IMPROPERLY POSITIONED OR BENT ROLLS

Michael G. Gonos, Monroeville Borough; Kenneth D. Ives, Plum Borough, and Ronald S. Vranka, Monroeville Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Original No. 3,939,568, dated Feb. 24, 1976, Ser. No. 503,147, Sep. 4, 1974. Application for reissue May 27, 1976, Ser. No. 690,743

Int. Cl.[2] **G01B** *5/00*

U.S. Cl. 33—143 L **31 Claims**



1. An apparatus for locating improperly positioned rolls among a set of rolls which are arranged in opposed pairs and have work-engaging faces defining a confined path of travel for a workpiece, said apparatus comprising a housing movable along said path, means carried by said housing at opposite faces thereof for abutting said work-engaging faces and guiding said housing, and a plurality of gap sensors carried by said housing and including heads supported for relative movement normal to the direction of movement of said housing along said path and adapted to contact the work-engaging faces of the individual roll-pairs successively at a plurality of locations along the length of the rolls, and transducer means operatively connected with said heads for transmitting signals representative of the measurements of the gaps between the work-engaging faces of each roll-pair contacted by said heads.

Re. 30,076
FOUR-WAY REVERSING VALVE WITH DIFFERENTIAL AREA OPERATOR

James M. Thornbery, Milwaukee, Wis., assignor to The Singer Company, New York, N.Y.

Original No. 3,894,561, dated Jul. 15, 1975, Ser. No. 450,984, Mar. 14, 1974. Application for reissue Jul. 9, 1976, Ser. No. 703,840

Int. Cl.[2] **F16K** *31/363*

U.S. Cl. 137—625.29 **3 Claims**

1. A reversing valve comprising,

a body including a valve chamber, a high pressure inlet to the chamber, a low pressure outlet from the chamber, and a pair of ports adjacent the outlet,

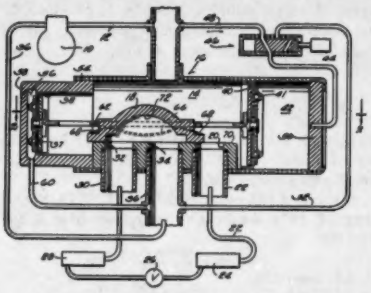
a slide valve in the chamber movable between two positions in which it serves to connect either of said ports to said outlet while the other port communicates with the chamber,

said body including a large diameter cylinder and a small diameter cylinder,

a piston in each cylinder, the pistons being interconnected and being connected to the slide valve,

means supplying a constant pressure to the space between the pistons,

one side of the smaller piston being exposed to the chamber pressure and the other side of the smaller piston being



[exposed to low pressure] *connected to said low pressure outlet* so there is always a pressure differential acting across the smaller piston,

means [supplying high or low pressure to] *for selectively connecting* the space between the larger piston and the head of the larger cylinder *to high pressure or to the low pressure outlet* to cause the pistons and slide valve to move between said positions by reason of the pressure differential acting across the small piston area in one position and by reason of the pressure differential across the difference in piston areas in the other position.

Re. 30,077
SURFACE FOR BOILING LIQUIDS

Leslie C. Kun, and Alfred M. Czikk, both of Williamsville, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Original No. 3,454,081, dated Jul. 8, 1969, Ser. No. 751,321, May 14, 1968. Continuation-in-part of Ser. No. 634,403, Apr. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 414,755, Nov. 30, 1964, abandoned. Application for reissue Dec. 19, 1977, Ser. No. 862,218

Int. Cl.[2] **F28F** *13/18, 19/02*

U.S. Cl. 165—133 **15 Claims**

17. A thermally conductive metal wall for transferring heat to a boiling liquid in a heat exchange apparatus which comprises a boiling surface layer formed from the wall having a plurality of ridges in said wall separated by first grooves with outer sections of said ridges partially deformed into said first

grooves, and a plurality of second grooves superimposed on said ridges at an angle to the orientation of said ridges, said ridges and first and second grooves being shaped such that a plurality of sub-surface cavities are formed in said first grooves with at least some of the cavities adapted to entrap vapor bubbles to provide boiling nucleation sites, the nucleation site cavities opening to the outer surface of said boiling surface layer through restricted openings having smaller cross-sectional areas than the largest cross-sectional area of the cavity interiors providing communication between the interiors of said cavities and the surface of said boiling surface layer for vapor egress, and said first and second grooves and cavities being formed to provide sub-surface openings between *said* at least some adjacent cavities for communication between the interiors of said adjacent cavities and the outer surface of said boiling surface layer for liquid ingress to sustain growth of entrapped vapor bubbles as vapor is expelled from said restricted openings, *with said first and second grooves each provided at density of from about 45 to about 225 grooves per inch.*

Re. 30,078

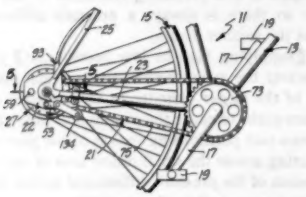
VEHICLE WITH VARIABLE SPEED TRANSMISSION

Trevor L. Harris, Costa Mesa, Calif., assignor to Harris Dynamics, Costa Mesa, Calif.

Original No. 3,913,947, dated Oct. 21, 1975, Ser. No. 479,797, Jun. 17, 1974. Application for reissue May 8, 1978, Ser. No. 904,005

Int. Cl.[2] B62M *1/04*

U.S. Cl. 280—236 **32 Claims**



1. A vehicle adapted to a move along a supporting surface comprising:

a frame

at least one wheel, said wheel having a centrally located hub;

first means cooperable with the hub for mounting the wheel on the frame for rotational movement relative to the frame about a first rotational axis, said wheel being adapted to roll along the supporting surface;

an inner rotatable member at least partially within said hub;

second means for mounting said inner rotatable member for rotational movement about a second rotational axis, said inner rotatable member and said hub being relatively movable along a path having a radial component to permit adjustment in the relative radial position of the first and second rotational axes;

drive means including at least one one-way clutch and at least one drive element for drively coupling said inner rotatable membeer to said hub, said one-way clutch and said drive element being within said hub, said drive element being drivable along a path which circumscribes the inner rotatable member;

means including a drive member outside said hub for imparting input motion to [at least one of said hub and] said inner rotatable member; and

means operable by the operator of the vehicle for [adjusting] *moving said inner rotatable member and said drive member to adjust* the relative radial position of said rotational axes whereby the drive ratio between said hub and said inner rotatable member can be varied by the operator.

Re. 30,079

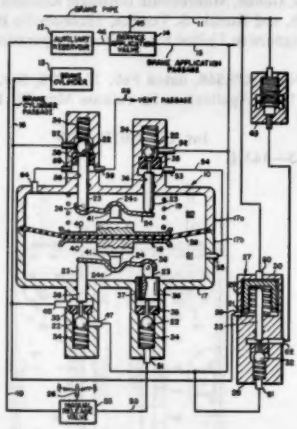
FLUID BRAKE CONTROL SYSTEM

Eugene D. McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Original No. 3,966,271, dated Jun. 29, 1976, Ser. No. 604,405, Aug. 13, 1975. Application for reissue May 13, 1977, Ser. No. 796,792

Int. Cl.[2] B60T *15/32*

U.S. Cl. 303—69 **11 Claims**



8. A fluid brake control system for a vehicle having a brake control pipe, a fluid reservoir, a brake cylinder, and a service valve governing flow of fluid from the reservoir through brake application and brake cylinder passages successively to the brake cylinder, wherein an improved brake cylinder release control device comprises:

a. a housing containing an abutment subject to actuation in response to the pressure of fluid in a chamber acting on said abutment in opposition to an opposing force acting also on said abutment,

b. at least one valve means disposed on each side of said abutment, each said valve means being of the poppet type and having relatively movable seat and closure elements, at least one of which is operatively connected to the associated side of said abutment,

c. said poppet valve means on one side of said abutment being opened by movement of said abutment in response to an increase in fluid pressure in said chamber in excess of a predetermined value to release fluid from said brake cylinder,

d. said poppet valve on the other side of said abutment being closed by movement of said abutment in response to an increase in fluid pressure in said chamber in excess of said predetermined value to prevent the flow of fluid from said brake application passage to said brake cylinder passage.

Re. 30,080

TITANIUM-BERYLLIUM BASE AMORPHOUS ALLOYS

Lee E. Tanner, Summit; Ranjan Ray, Morristown, both of N.J., and Carl F. Cline, Walnut Creek, Calif., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

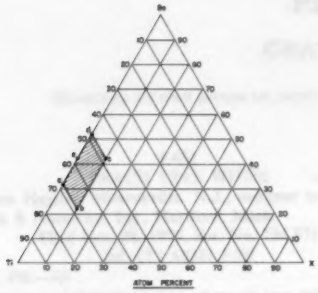
Original No. 3,989,517, dated Nov. 2, 1976, Ser. No. 572,563, Apr. 28, 1975. Continuation-in-part of Ser. No. 519,394, Oct. 30, 1974, abandoned. Application for reissue Aug. 11, 1977, Ser. No. 823,802

Int. Cl.[2] C22C *14/00*

U.S. Cl. 75—175.5 **6 Claims**

1. A high strength, low density metal alloy that is substantially amorphous, characterized in that the alloy comprises about 48 to 68 atom percent titanium and about 32 to 52 atom percent beryllium, with a maximum of up to 10 atom percent of beryllium replaced by at least one additional alloying element

selected from the group consisting of the transition metals listed in Groups IB to VIIB and Group VIII, Rows 4, 5 and 6,



of the Periodic Table and of the metalloid elements—phosphorus, boron, carbon, aluminum, silicon, tin, germanium, indium and antimony.

Re. 30,081

ION EXCHANGE CHROMATE REMOVAL

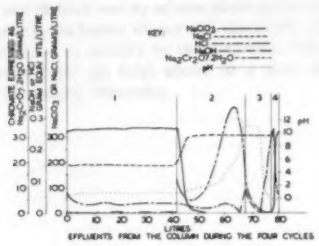
Frank R. Foulkes, Toronto, Canada, assignor to Huron Chemicals, Limited, Kingston, Canada

Original No. 3,980,751, dated Sep. 14, 1976, Ser. No. 633,831, Nov. 20, 1975. Application for reissue May 25, 1978, Ser. No. 909,589

Claims priority, application Canada, Nov. 20, 1974, 214231

Int. Cl.[2] C01G *37/14*; C01B *11/02*

U.S. Cl. 423—54 **13 Claims**



1. A method of removing chromate from aqueous solutions of alkali metal chlorate and alkali metal chloride which comprises in an exhaustion stage (1) passing said aqueous solution of alkali metal chlorate and alkali metal chloride acidified with hydrochloric acid to a pH of not less than 0.5 through an anion exchange resin bed to remove chromate therefrom and produce an essentially chromate free aqueous solution containing alkali metal chlorate and alkali metal chloride, and in a regeneration stage (2) passing an aqueous solution of alkali metal hydroxide and alkali metal chloride through said resin bed to remove chromate therefrom, (3) passing an aqueous solution of alkali metal chloride acidified with hydrochloric acid to a low pH through said resin bed to convert said resin to acid form and (4) passing an aqueous solution of essentially chromate free alkali metal chlorate and alkali metal chloride acidified with hydrochloric acid to a pH value not less than 0.5, through said resin bed to saturate said resin bed with alkali metal chlorate.

11. A process as claimed in claim **1** in which the [anionic] *anion* exchange resin is a weakly basic resin.

13. A method as claimed in claim **1** in which the product effluent is fed to a chlorine dioxide generator for production of chlorine dioxide.

Re. 30,082

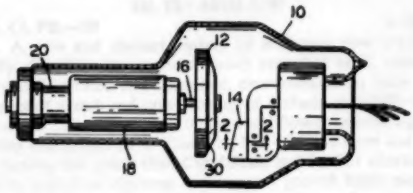
X-RAY TUBE HAVING FOCUSING CUP WITH NON-EMITTING COATING

Zed J. Atlee, Tigard, Oreg., and Roy F. Kasten, Jr., Elmhurst, Ill., assignors to Picker Corporation, Cleveland, Ohio

Original No. 3,783,323, dated Jan. 1, 1974, Ser. No. 284,735, Aug. 30, 1972. Application for reissue Jan. 27, 1977, Ser. No. 645,835

Int. Cl.[2] H01J *35/00*

U.S. Cl. 313—57 **11 Claims**



1. An x-ray tube in which the improvement comprises:

an anode;

a focusing electrode *including a body having a focusing recess therein which defines a focusing surface;*

a thermionic cathode mounted *in said recess* adjacent *said focusing surface of* said focusing electrode so that said focusing [electrode] *surface* focuses the electrons emitted by said cathode onto said anode to cause x-rays to be emitted from said anode;

an evacuated envelope containing said cathode, anode and focusing electrode; and

a layer of non-electron emissive material provided on at least a portion of *said focusing surface* of the focusing electrode and having a higher work function than the underlying base material of said focusing electrode [substantially] to prevent the *field* emission of electrons from said focusing electrode.

PLANT PATENTS

GRANTED AUGUST 21, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,451

PEACH TREE WH215

J. Wilson Hughes, Monroeville, N.J., assignor to Hilltop Orchards & Nurseries, Inc., Hartford, Mich.

Filed Oct. 28, 1976, Ser. No. 736,576

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as shown and described.

4,452

ROSE PLANT—GABRIELLA

Lars Berggren, Vällingby, Sweden, assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Dec. 12, 1977, Ser. No. 859,793

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the described difference in bud and bloom color set forth above on a plant otherwise identical to the variety Mercedes.

4,453

DISTINCT VARIETY OF BLUEGRASS PLANT

William H. Daniel, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed May 15, 1978, Ser. No. 905,850

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of bluegrass plant, *Poa pratensis,* substantially as described and illustrated, and particularly characterized by a medium green color, vigorous rhizome spread, and good disease tolerance.

4,454

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jun. 21, 1978, Ser. No. 935,733

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a rich red color, being of a shade generally near Geranium Lake 20 or 20/1, the bud and flower resembling the variety Carol-Jean (U.S. Plant Pat. No. 4,254) in form and size but having less petals than Carol-Jean; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy foliage and an abundance of flowers borne usually in loose clusters of 3 to 5 or more.

PLANT PATENTS

GRANTED AUGUST 21, 1979

PATENTS

GRANTED AUG. 21, 1979

ERRATA

For CLASS	See PATENT NO.
128–652	4,164,863
409–165	4,164,891
128–438	4,164,934
414–063	4,165,006
414–494	4,165,007
414–750	4,165,008
406–010	4,165,132
406–109	4,165,133
406–001	4,165,134
406–152	4,165,135
355–004	4,165,165
435–267	4,165,250
435–262	4,165,257
435–215	4,165,258
585–638	4,165,343
525–111	4,165,344
525–419	4,165,345
525–432	4,165,346
525–196	4,165,347
525–397	4,165,422
546–273	4,165,428
544–021	4,165,429
544–022	4,165,430
525–357	4,165,431

PATENTS

GRANTED AUG. 21, 1979

ERRATA

Re	Pat
CASE	PATENT NO.
135-402	4,149,803
409-165	4,164,997
129-478	4,166,974
414-060	4,163,009
474-494	4,152,007
415-750	4,165,038
406-010	4,165,132
409-199	4,165,137
408-007	4,165,138
409-155	4,165,155
225-004	4,165,180
415-501	4,168,330
418-163	4,161,330
415-118	4,166,274
225-406	4,165,313
225-117	4,152,344
225-449	4,165,347
225-421	4,156,346
225-196	4,165,347
225-007	4,165,452
225-225	4,165,459
224-022	4,167,429
224-023	4,164,519
225-127	4,165,611

PATENTS

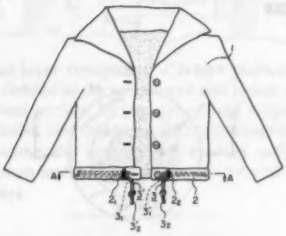
GRANTED AUGUST 21, 1979

GENERAL AND MECHANICAL

4,164,792
DEVICE FOR TIGHTENING THE WAIST OF A GARMENT

Mitsuru Ito, 322 E. 55th St., Apt. 3B, New York, N.Y. 10022

Filed Jul. 25, 1977, Ser. No. 819,034
Claims priority, application Japan, Aug. 31, 1976, 51/115800[U]
Int. Cl.[2] A41D *1/02*
U.S. Cl. 2—108 **9 Claims**



1. A device for tightening the waist of a garment which is separated and opened in the front of the wearer's body, comprising a sheath which is provided around the waist of the garment and terminates at its opposite ends in respective openings at either side of the garment opening, a first string which is secured to the sheath adjacent to one of the two openings thereof and which passes through the sheath and out of the sheath through the other opening thereof, and a second string which is secured to the sheath adjacent said other opening thereof and passes through the sheath and out of the sheath through said one opening thereof.

4,164,793
LUNATE IMPLANT

Alfred B. Swanson, 2945 Bonnell, S.E., Grand Rapids, Mich. 49506

Filed Apr. 26, 1978, Ser. No. 900,188
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **7 Claims**

1. An implant for replacement of the lunate bone, said implant adapted to be surgically positioned adjacent the triquetrum bone, the scaphoid bone, the capitate bone and the radius bone, said implant comprising:

a one piece body of resilient material, said body defining:

a planar triquetrum face having a general U-shape in plan and including outwardly angled edges, a curvilinear proximal edge and a curvilinear distal edge, said distal edge having a radius of curvature greater than the radius of said proximal edge and a stabilizing stem extending outwardly from and perpendicular to said planar triquetrum face, said stem adapted to be inserted within the intramedullary canal of the triquetrum bone;

a planar scaphoid face having a general U-shape in plan and including outwardly angled edges lying in substantially the same perpendicular plane as the lateral edges of the triquetrum face, said scaphoid face having a curvilinear proximal edge and a curvilinear distal edge, the radius of curvature of the distal edge being substantially the same as the radius of curvature of the distal edge of said triquetrum face, said scaphoid face having a length less than the length of said triquetrum face and being adapted to articulate with the scaphoid bone, said scaphoid face and said triquetrum face being angled outwardly with respect to each other from said distal edges to said proximal edges;

a cupped, concave, smooth distal surface adapted to articulate with the head of the capitate bone to stabilize said implant, said distal surface lateral edges being defined by said distal edges of said triquetrum and said scaphoid faces;

a proximal surface having a smooth convex shape joining said proximal edges of said triquetrum and said scaphoid faces;

a generally planar dorsal surface extending between the dorsal lateral edges of said triquetrum and scaphoid faces, said dorsal surface having a straight distal edge and a curved proximal edge smoothly joining with said proximal surface, said proximal edge having a decreasing radius from said scaphoid face to said triquetrum face; and

a generally planar palmar surface extending between the palmar lateral edges of said triquetrum and scaphoid faces, said palmar surface having a straight distal edge and a curved proximal edge smoothly joining with said proximal surface, said body being substantially symmetrical about a longitudinal centerline passing through said distal surface and said proximal surface and along the longitudinal centerlines of said scaphoid and said triquetrum faces.

4,164,794
PROSTHETIC DEVICES HAVING COATINGS OF SELECTED POROUS BIOENGINEERING THERMOPLASTICS

Myron Spector, Charleston, S.C.; George T. Kwiatkowski, Greenbrook, N.J.; Walter H. Smarock, Somerville, N.J., and Michael J. Michno, Jr., Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 14, 1977, Ser. No. 787,531
Int. Cl.[2] A61F *1/24;* C08J *9/24, 5/00*
U.S. Cl. 3—1.912 **30 Claims**

1. An efficacious prosthetic device comprised of a load

bearing functional component and, over at least a portion thereof, a porous coating of a bioengineering thermoplastic material which is compatible with, and conducive for, the ingrowth of bone spicules, said material being selected from the group consisting of polysulfones, polyphenylenesulfides, polyacetals, thermoplastic polyesters, polycarbonates, aromatic polyamides, aromatic polyamideimides, thermoplastic polyimides, polyaryletherketones, polyarylethernitriles and aromatic polyhydroxyethers, and having the following properties:

(a) an average pore diameter of from about 90 to about 600 microns;

(b) pore interconnections having average, diameters of greater than about 50 micron;

(c) a modulus of elasticity from about 250,000 to about 500,000 pounds per square inch for non-reinforced, solid non-porous thermoplastic material, and from about 500,000 to about 3,000,000 pounds per square inch for reinforced, solid non-porous thermoplastic material;

(d) a porosity of greater than about 40 percent; and

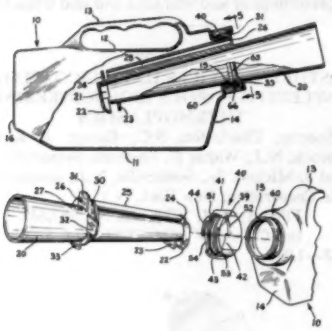
(e) a total creep strain of said non-reinforced, solid, non-porous thermoplastic material of less than one percent at a constant stress of 1,000 pounds per square inch at ambient temperature; all of the properties being sufficient to enable stresses applied on the musculoskeletal system to be transferred to bone spicules within the pores of said material and maintain sufficient load and pore stability to promote irreversible ossification.

4,164,795

PORTABLE URINAL

Ernest K. Johnson, 91119 Hill Rd., Springfield, Oreg. 97477

Filed Jul. 28, 1978, Ser. No. 929,031
Int. Cl.[2] A47K *11/00*
U.S. Cl. 4—144.1 **8 Claims**



1. A urinal comprising a container having top and bottom sides and a circular opening in one end thereof, an approximately horizontal removable inlet tube having one end insertable into said opening, an eccentric circular flange on said inlet tube arranged to seal against the margin of said opening, a plurality of radial lugs outstanding from said flange, a plurality of axial projections mounted in fixed positions around the periphery of said opening, circumferential grooves in said projections to receive said lugs in rotary movement for mounting said inlet tube in the container, and circumferential spaces between said projections to admit said lugs into said grooves, the circumferential widths of said lugs, projections and spaces being non-uniformly arranged to admit said lugs into said grooves for connection of said inlet tube with said container in only one rotative position of the inlet tube.

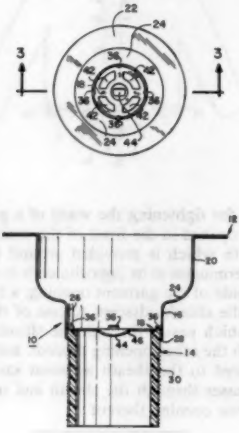
6. A urinal comprising a container having top and bottom sides and a screw threaded neck on one end of the container, a coupling having a screw thread arranged to tighten in a predetermined orientation on said neck thread, circumferentially spaced axial projections on said coupling, a circumferential groove in each of said projections, an inlet tube insertable into said neck, an air vent tube extending along one side of said inlet tube and integral therewith, a circular flange on said inlet tube having radial lugs insertable into the spaces between said projections for rotation into said grooves to mount said inlet tube in the container, and means to accept said inlet tube for said mounting in only one rotative position of said inlet tube.

4,164,796

SINK STRAINER ASSEMBLY

Lawrence Sakow, 2417 Delancy Pl., Philadelphia, Pa. 19103

Filed Oct. 5, 1977, Ser. No. 839,426
Int. Cl.[2] E03C *1/26*; A47K *1/14*
U.S. Cl. 4—288 **9 Claims**



1. A sink strainer assembly adapted to be fastened within a sink for passing materials through the sink to a drainage area, said assembly including:

a hollow, metallic strainer body including a hollow hub section at its lower end;

a hollow, plastic nipple having an upper head section and a lower threaded section, said nipple being in a force-fit, liquid-tight relationship within said hub section with the lower threaded section of the nipple extending beyond the end of the hub section for receiving a threaded coupling;

a filtering screen having openings therethrough, said screen being positioned on the upper surface of the head section of the nipple to intercept the flow of solids through the assembly; and

locking means for engaging said screen to retain it on the upper surface of the head of the nipple,

the locking means including a plurality of tabs spaced about the periphery of the nipple and forming a part of said nipple, said tabs extending above the upper surface of the screen and being in contact with the screen.

4,164,797

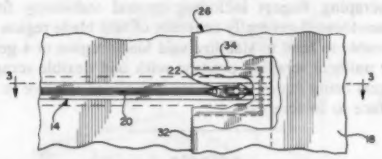
ZIPPER CONSTRUCTION FOR MATTRESSES AND THE LIKE

Gerald A. Golembeck, Lake Elmo, Minn., assignor to The United States Bedding Company, St. Paul, Minn.

Filed Apr. 6, 1978, Ser. No. 893,992
Int. Cl.[2] A47G *9/04*; A47C *31/00*
U.S. Cl. 5—470 **3 Claims**

1. In a mattress construction comprising a filler and a mattress cover, said cover defining an opening along at least one of its sides, and a zipper including a chain and closer for closing

said opening, the improvement comprising a fabric section connected to said cover and extending perpendicular to said zipper, said section comprising a double thickness of fabric extending in overlapping relationship with a portion of the cover supporting said zipper whereby the section overlaps one end of said zipper, said double thickness including a first layer comprising a continuation of the fabric on a side of the cover



and a second layer comprising a return portion of the first layer, a fold defined at the juncture of said layers, and a pocket defined by said section for receipt of said closer when said opening is closed, said fold being stitched to said portion of the fabric supporting the zipper, and wherein said stitching is interrupted at an intermediate position to provide the opening for said pocket.

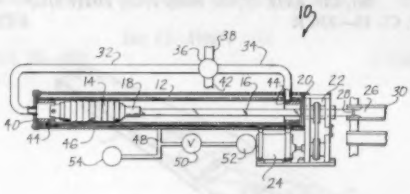
4,164,798
SEAT CUSHION
Joseph T. Weber, P.O. Box 26424, Charlotte, N.C. 28213
Filed Jul. 23, 1976, Ser. No. 708,132
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—464 **3 Claims**

1. A seat cushion for preventing excessive pressure on the coccyx of a person sitting on said cushion, said cushion consisting essentially of a seat pad having a casing, said casing having positioned therein a resilient cushioning element, said cushioning element having a recessed portion therein, said recessed portion located in the rear center portion of said cushioning element so as to be in underlying relationship to the coccyx, said casing being free of a recessed portion and providing means for nominally supporting the coccyx, the surface of said casing which comes in contact with the person sitting on said seat cushion consisting essentially of a fluffy, moisture-absorbing fibrous material.

4,164,799
MACHINE FOR CLEANING TUBES AND PIPES
Kenneth Jai, 3425 Durwood Dr., Beaumont, Tex. 77704
Filed Jun. 13, 1978, Ser. No. 915,004
Int. Cl.[2] F28G *3/10*; B08B *9/02*
U.S. Cl. 15—104.1 R **8 Claims**

1. A pipe cleaning machine including an enclosed, elongated cylinder, a piston located within said cylinder, a non-round piston rod attached to said piston so as to extend out of one end of said cylinder, control means for introducing a high pressure fluid into and out of the ends of said cylinder, rotary seal means for forming a seal around said piston at said end of said cylinder, and motion transmitting means for rotating said piston rod during movement of said piston in which the improvement comprises:

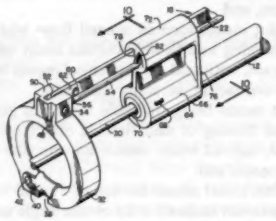
a second enclosed cylinder located concentrically around said first mentioned cylinder so as to provide an enclosed



space around said first mentioned cylinder throughout the length of said first mentioned cylinder, and

discharge means for discharging any fluid within said space in the event of rupture of said first mentioned cylinder.

4,164,800
COMBINATION MOP AND WRINGER
Martin P. Strahs, Lawrenceville, N.J., assignor to Quickie Manufacturing Corp., Cinnaminson, N.J.
Continuation-in-part of Ser. No. 732,054, Oct. 13, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 895,738
Int. Cl.[2] A47L *13/14*
U.S. Cl. 15—119 R **9 Claims**



6. In a combination mop and wringer of the type having a mop affixed at one end of a handle and a slide assembly which is reciprocal relative to the handle between an initial position and a mop wringing position to wring water from the mop comprising:

guide block means secured to the handle to guide movement of the slide assembly relative to the handle;

said guide block means comprising an opening which is positioned in spaced relationship from the handle;

the slide assembly comprising a slide arm, a portion of which is always positioned within the opening as the slide assembly is reciprocated, the slide arm and said opening being so configured that the slide arm is limited to slidable movement and

detent means projecting from the slide arm to hold the slide assembly in the initial position in stationary relationship relative to the guide block means; and

resilient locking means formed in the opening of the guide block means to secure the detent means is a releasable engagement,

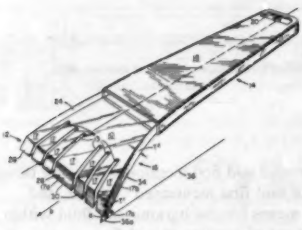
whereby the slide assembly can be secured to the said initial position to prevent unintentional movement of the slide assembly toward the wringing position.

4,164,801

BEAR CLAW ICE SCRAPER

Robert R. Thomas, Hartford, Kans., assignor to Hopkins Manufacturing Corporation, Emporia, Kans.

Filed Nov. 2, 1977, Ser. No. 847,742
Int. Cl.[2] A47L *17/06*; B60S *1/04*; E01H *5/02*
U.S. Cl. 15—236 R **4 Claims**



1. A hand-held scraper for removing ice from a smooth surface, said scraper comprising a one piece body defining;

a handle section;

an intermediate section extending from said handle section; and

a blade region comprising a plurality of concave, resilient, independently flexible, scraping fingers, each extending from said intermediate section and terminating in a scraping edge,

each said flexible scraping finger comprising

flexible chisel means, terminating in a said scraping edge, and operable to engage an ice covered surface with an ice deflecting surface thereof being inclined at an obtuse angle in relation to a portion of said surface to be scraped,

flexible curved beam means connected with said intermediate section, and

concave joint means located spaced from said surface and interconnecting said flexible curved beam means and said chisel means, with said flexible chisel means being inclined in a forward facing, scraping direction,

said joint means being operable to permit generally independent flexing of said flexible chisel means and said flexible, curved beam means on opposite ends of said joint means; and

said flexible chisel means having an overall wedge shaped configuration inclined at an obtuse angle in relation to a portion of said surface to be scraped and having a median thickness less than the median thickness of said flexible, curved beam means;

said scraping fingers being operable, when a user gripping the handle section applies forces generally longitudinally of an ice covered surface to be scraped,

to independently flex so that said scraping, edges are operable to become independently wedged in ice to be scraped and ice fracturing energy is stored in said flexible, curved beam means,

to exert force against the ice resulting from energy imparted to said handle by said user and said stored energy, said force being sufficient to cause fracturing of said ice, and

to resiliently return to their original shape and therefore facilitate displacing of fractured ice away from the surface to be scraped; and

at least some of said scraping fingers each having and end, merging with said intermediate section, and having a width, measured transversely of said direction of applied force and across said ice covered surface, which is less than the width of the scraping edge thereof, each such scraping finger being defined by

lateral edges which converge longitudinally of said direction of applied force and away from the scraping edge thereof;

said fingers alternating transversely of said blade region with groove means, with

said blade region including a plurality of said groove means, and

said plurality of said groove means being generally mutually converging in a direction extending generally longitudinally of said scraper and away from said scraping edge; and

said scraping fingers including central stabilizing finger means located generally centrally of said blade region and operable to tend to stabilize said blade region in a generally uniform scraping position with said flexible scraping fingers being generally uniformly inclined relative to said surface to be scraped.

4,164,802

DETERGENT HOLDER ON WINDSHIELD WIPER ARM

Donald E. Rouse, Gladstone, Oreg., assignor to Wiper-Mate, Inc., Milwaukie, Oreg.

Filed Sep. 8, 1978, Ser. No. 940,788
Int. Cl.[2] B60S *1/02*
U.S. Cl. 15—250.03 **9 Claims**

1. A detergent holder for a windshield wiper comprising a rod, means for mounting one end of said rod on an oscillating arm which carries said wiper, with the other end of said rod extending alongside said wiper, a pair of arcuate cartridge track arms having free ends extending laterally from said other end of said rod, and a replaceable cartridge having rotatable engagement with said track arms, said cartridge comprising a generally cylindrical housing alongside said wiper and having a longitudinal outlet opening in its rear side which faces the windshield, said cartridge including arcuate means on the opposite ends of said housing for receiving said free ends of said cartridge track arms, a detergent stick in said housing, an inlet opening in one side of said housing for the entrance of water into said housing when a vehicle carrying said wiper and detergent holder is in forward motion with the wiper in operation, and a hood on said housing extending over said inlet opening when the wiper is in rest position to shield said inlet opening from falling rain when the wiper is not operating.

4,164,803

PAINT PAN FOR APPLYING PAINT TO PADS AND ROLLERS

Adam Zurawin, New York, and Gaetano Ricciuti, Bronx, both of N.Y., assignors to Adams Brush Manufacturing Co., Inc., Brooklyn, N.Y.

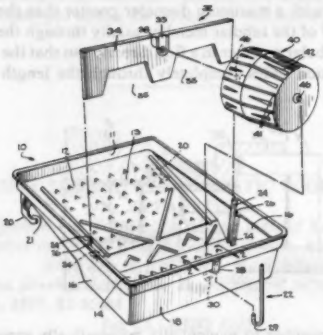
Filed Oct. 18, 1977, Ser. No. 843,212
Int. Cl.[2] B05C *1/02*; B65D *1/36*
U.S. Cl. 15—257.05 **3 Claims**

1. In a paint roller pan of the type having a front wall, two side walls, a rear wall and a bottom wall having a front portion angled downwardly from said front wall to a zone intermediate said front and rear walls to define a trough on which a paint roller may be rolled to distribute paint thereon, and a rear horizontal portion defining the bottom of a paint sump, the

improvement comprising means for converting said roller pan to a paint pad applicator, said means including:

a partition wall dimensioned to extend transversely of said tray between said side walls;

means disposed on the interior of each of said two side walls for removably mounting said partition wall on said side walls;



a cylindrical paint transfer roller; and

means on the partition and rear wall for detachably mounting said roller between said partition wall and the interior of the rear wall of said tray, said roller being of diameter to dispose a portion thereof into said paint sump so that the roller is operative to transfer paint in said sump to a paint pad.

4,164,804

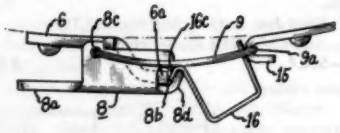
LATCH DEVICE

Thomas A. Fletcher, Dana, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,884

Int. Cl.[2] F16L *33/12*

U.S. Cl. 24—273 **5 Claims**



1. A latch device comprising in combination, a base member adapted to be fixed to one of two parts to be detachably connected to each other, a lever member hingedly connected at one end to said base member for movement between a locked and an unlocked position, said lever member being formed with a lip projecting from said end, a generally U-shaped link member comprising elongated arms having free ends pivotally connected to said lever member intermediate the ends thereof and having a bight portion adapted to engage hook means on the other of said parts, and a channel-shaped spring catch having opposite sides resiliently compressible toward each other, said spring catch being loosely attached at one of said sides to said link member and being formed on the other of said sides with a flange engageable with said lip of said lever member, whereby when the latch device is in locked position with said link member engaging the hook means and said flange of said spring catch engaging said lip with said other side of said spring catch bearing against the hook means, said spring catch resiliently retains said link member in firm engagement with the hook means.

4,164,805

APPARATUS FOR DIVIDING WARPS WITH LEASES

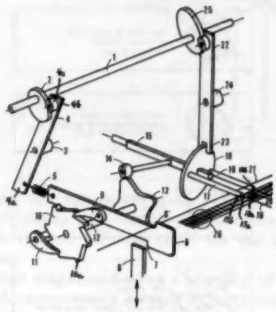
Alois Altenweger, Uster, Switzerland, assignor to Zellweger Uster Ltd., Uster, Switzerland

Filed Mar. 16, 1978, Ser. No. 887,437

Claims priority, application Switzerland, Jun. 24, 1977, 7762/77

Int. Cl.[2] D03G *1/16*

U.S. Cl. 28—202 **7 Claims**



1. An apparatus for separating warp threads by means of leases, comprising:

thread divider elements for separating an edge warp thread from a sheet of warp threads;

thread feeder means, being a part of a movable divider rod, for delivering the separated warp thread to tying means;

lease means provided for said warp threads;

means for controlling operation of said divider elements such that said divider elements in conjunction with said lease means, following the separation of an edge warp thread, change their position relative to the sheet of warp threads in such a manner that all warp threads, following the separated edge warp thread, are displaced toward the sheet of warp threads;

means for enabling said thread feeder means to only then move through its complete path needed for the feed of the separated warp thread to the tying means when there has been actually separated an edge warp thread;

said means for controlling operation of said divider elements incorporating means for ensuring that said divider elements only then change their position relative to the sheet of warp threads when the thread feeder means has moved through said complete path;

said movable divider rod being equipped with a blocking nose;

said enabling means including locking means coacting with said blocking nose for blocking said divider rod;

said divider rod separating the edge warp thread as soon as said locking means is out of engagement with said blocking nose;

said ensuring means including a pawl and ratchet wheel cooperating with said divider rod; and

said ratchet wheel being indexed by said pawl whenever said divider rod separates the edge warp thread.

4,164,806

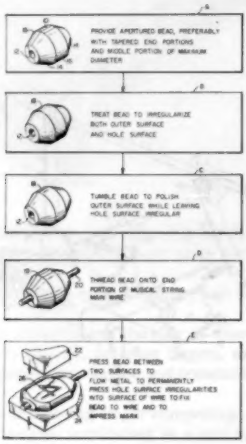
METHOD FOR ATTACHING AN END BEAD TO A MUSICAL INSTRUMENT STRING

W. Norman Stone, Bloomfield, Conn., and Robert A. Allmansberger, Bridgewater, N.J., assignors to National Musical String Company, New Brunswick, N.J.

Continuation-in-part of Ser. No. 757,082, Jan. 5, 1977, abandoned. This application Oct. 18, 1977, Ser. No. 843,210

Int. Cl.[2] B21D *39/00*; B23P *11/00*

U.S. Cl. 29—517 **11 Claims**


PROVIDE APERTURED BEAD, PREFERABLY WITH TAPERED END PORTIONS AND MIDDLE PORTION OF MAXIMUM DIAMETER
TREAT BEAD TO IRREGULARIZE BOTH OUTER SURFACE AND HOLE SURFACE
TUMBLE BEAD TO POLISH OUTER SURFACE WHILE LEAVING HOLE SURFACE IRREGULAR
THREAD BEAD ONTO END PORTION OF MUSICAL STRING MAIN WIRE
PRESS BEAD BETWEEN TWO SURFACES TO FLOW METAL TO PERMANENTLY PRESS HOLE SURFACE IRREGULARITIES INTO SURFACE OF WIRE TO FIX BEAD TO WIRE AND TO IMPRESS MARK

1. The method of attaching a metal bead to the main wire of a musical instrument string, which method comprises the steps of: providing a metal bead having two ends and a hole extending therethrough between said ends and also having a middle portion of maximum thickness and two end portions on opposite sides of said middle portion each of which diminishes in thickness in going from said middle portion to the adjacent one of said two ends, said hole of said bead being defined by a hole surface having irregularities, threading said bead onto the end portion of a musical instrument main wire, and then plastically deforming said bead by pressing its middle portion between two generally flat and parallel surfaces to flow the metal of said bead and to permanently press said irregularities of said hole surface into the surface of said wire to fix said bead to said wire, whereby the deformation which occurs at said ends of said bead during said pressing step is substantially less than that which occurs in said middle portion.

4,164,807

METHOD OF FORMING A COLDWORKED JOINT

John O. King, Jr., 3990 N. Ivy Rd., Atlanta, Ga. 30342

Division of Ser. No. 501,487, Aug. 29, 1974, Pat. No. 3,949,535, which is a continuation-in-part of Ser. No. 324,485, Jan. 17, 1973, Pat. No. 3,835,688, which is a continuation-in-part of Ser. No. 268,478, Jul. 3, 1972, Pat. No. 3,835,615, which is a continuation-in-part of Ser. No. 33,281, Apr. 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 711,368, Mar. 7, 1968, abandoned. This application Mar. 19, 1976, Ser. No. 668,489

The portion of the term of this patent subsequent to Sep. 17, 1991, has been disclaimed.

Int. Cl.[2] B21D *39/00*; B23P *11/02*

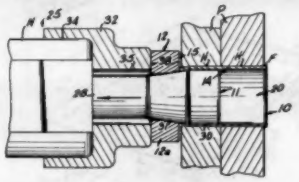
U.S. Cl. 29—523 **5 Claims**

1. A method of coldworking a hole through a work piece comprising the steps of:

placing a metal seamless cylindrical tubular member with a uniform wall thickness within the hole having a prescribed hoop strength sufficiently low to allow said seamless tubular member to be non-elastically radially and circumferentially expanded and a prescribed column strength sufficient to substuantially prevent axial movement of the outside of the tubular member as the tubular member is expanded within the hole;

holding the tubular member within the hole so that the tubular member is substantially axially fixed with respect to the hole;

passing an expansion mandrel having an expansion section thereon with a maximum diameter greater than the inside diameter of the tubular member axially through the inside of the tubular member in a first direction so that the expansion section slides completely through the length of the



tubular member to sequentially nonelastically expand the tubular member radially and circumferentially beyond its yield point as the expansion section passes therethrough sufficiently to force the outside of the tubular member into contact with the surface of the hole and to cause the tubular member to uniformly enlarge the hole along its length; and

leaving the tubular member in the hole so that the tubular member maintains a first radially oriented compressive stress gradient of a prescribed magnitude within the material of the work piece substantially uniformly about the entire inside surface of the hole.

4,164,808

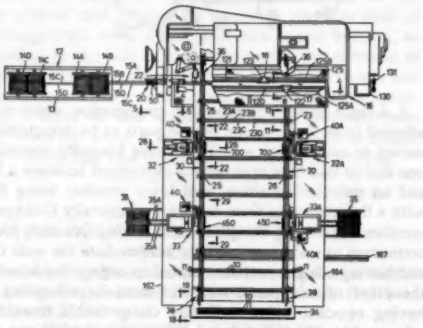
APPARATUS FOR PRODUCING SETS OF ACCURATELY AND IDENTICALLY SIZED WIRE LEADS

Ragnar Gudmestad, West Allis, and Gerald E. Blaha, Waukesha, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Jun. 5, 1978, Ser. No. 912,719

Int. Cl.[2] H01R *43/04*; H02G *1/12*

U.S. Cl. 29—564.4 **5 Claims**



1. Apparatus for high-speed production of sets of accurately and identically sized wire leads comprising:

a feed mechanism having means for repeatedly drawing a plurality of separate strands of wire simultaneously from a plurality of wire reels;

a mechanism having means for simultaneously straightening and arranging the strands as they are drawn therethrough

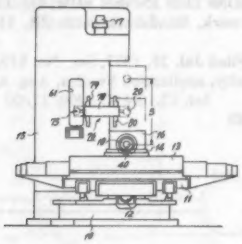
in parallel spaced apart relationship in a common generally horizontal plane;
a severing mechanism having means for repeatedly severing sets of wire segments of predetermined length simultaneously from the strands;
conveyor clamps for releasably gripping successive sets of wire segments received from the feed mechanism;
and conveyor means for advancing the conveyor clamps.

4,164,809

MACHINE TOOL WITH AUTOMATIC TOOL CHANGE APPARATUS

Akira Tsuboi, and Tetsuro Yamakage, both of Kariya, Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Dec. 6, 1977, Ser. No. 858,016
Claims priority, application Japan, Dec. 6, 1976, 51-146257; Feb. 16, 1977, 52-16484
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **5 Claims**



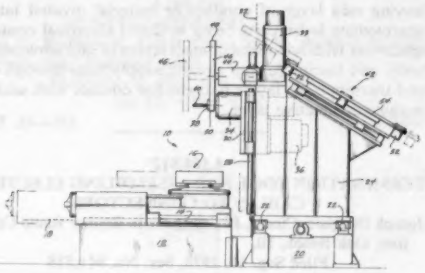
1. A machine tool for machining a workpiece comprising:
an upstanding column having a front wall and a side surface, said column being formed with an opening at its front wall;
a spindle head slidably mounted upon the side surface of said column and adapted to be positioned to a first predetermined position;
a spindle rotatably supported by said spindle head;
a magazine base extending within said column;
a plurality of sprocket wheels rotatably supported on said magazine base;
a flexible endless chain engaged by said sprocket wheels;
a plurality of socket support members, each secured on said endless chain and formed with a pair of vertical plates, spaced apart a predetermined distance in the direction of movement of said endless chain;
a plurality of tool sockets, each removably received between said pair of vertical plates for removably and vertically supporting a tool;
drive means operatively connected to one of said sprocket wheels for driving said endless chain;
means for selectively indexing said tool socket to a second predetermined position adjacent said opening inside said column;
means for moving said tool socket, removably holding said tool, between said second predetermined position and a third predetermined position outside said column through said opening; and
means for exchanging said tool held in said tool socket at a third predetermined position for said tool held by said spindle supported by said spindle head at said first predetermined position.

4,164,810

AUTOMATIC TOOL CHANGER FOR MACHINE TOOL

Charles B. Sipek, Hales Corners; Richard Johnstone, Brookfield, and Russell B. Clegg, Milwaukee, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Dec. 15, 1977, Ser. No. 860,705
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **11 Claims**



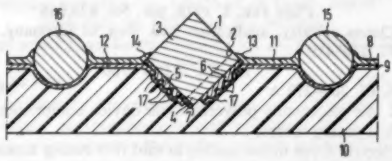
5. A machine tool having a frame;
a spindle rotatably supported by said frame and having means to receive different tools for use in machining operations;
a tool storage magazine having a plurality of tool carriers with each carrier being adapted to carry one of the tools to be used in said spindle;
a tool ready station at which said magazine is stopped to orient one of said tools in a predetermined position prior to a magazine shifting operation;
means connected to such magazine to rotate the magazine for moving a selected one of said tool carriers into said tool ready station;
tool change arm means having at least one grip for holding a tool and being movably supported by said frame for transferring tools between said spindle and said tool storage magazine;
a tool exchange position laterally spaced from said tool ready station at which said tool change arm means can operatively grip a tool from said magazine for transfer to the spindle; and
means connected to said magazine to shift the magazine laterally in a rectilinear movement for relocating said tool supported in the magazine from said tool ready station to the tool exchange position where the tool is aligned with the grip of said tool change arm means.

4,164,811

PROCESS FOR MAKING A SEMICONDUCTOR COMPONENT WITH ELECTRICAL CONTACTS

Walter Heywang, Neukeferloh, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1977, Ser. No. 771,848
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610539
Int. Cl.[2] H05K *3/00*
U.S. Cl. 29—628 **7 Claims**



1. A process for the production of a semiconductor component with electric contacts in which a layer sequence com-

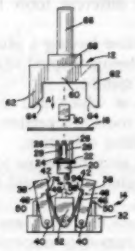
posed of upper and lower layers of thermoplastic material is formed with an intermediate layer of conductive material between said upper and lower layers, taking a semiconductor body having at least two sides with metal contact layers, respectively, on each of two sides, raising the temperature of the semiconductor body to a point which will soften the thermoplastic material, forcing said semiconductor body with its metal contact layers through one of said thermoplastic layers and into a portion of the other of said thermoplastic layers leaving said layer of conductive material divided into two intermediate layer parts being in direct electrical contact respectively with said metal contact layers of said semiconductor body, and forcing further electric supply lines through one of said thermoplastic layers into electric contact with said intermediate conductive layer.

4,164,812

TERMINATION TOOL FOR ASSEMBLING ELECTRICAL CABLES TO CONNECTORS

Joseph Dragisic, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sep. 11, 1978, Ser. No. 941,518
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—749 **26 Claims**



1. A termination tool for assembling electrical cables, such as ribbon cables or the like, to an electrical connector which has receptacle means for receiving a cable in electrical termination with conductive contacts on the connector, comprising:

a base having locator means for properly locating a connector in position for receiving an electrical cable;

clamping means movably mounted on said base for engaging a properly positioned connector to hold the connector in position during a termination operation;

stuffer means mounted on the tool for movement toward and away from said base and locator means to drive a cable into the receptacle means of the connector; and

said stuffer means including means for effecting movement of said clamping means into engagement with the connector in response to the stuffer means being moved to drive the cable into the receptacle means of the connector.

4,164,813

ELECTRICALLY POWERED KNIFE

Karl Dittert, Schwäbisch Gmünd, and Hans W. Hartkorn, Munich, both of Fed. Rep. of Germany, assignors to Ritterwerk GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 875,068
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705419
Int. Cl.[2] B26B *7/00*
U.S. Cl. 30—272 A **10 Claims**

1. An electrically powered knife device comprising

first casing means,

electric drive motor means in said first casing means,

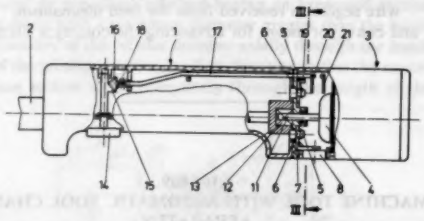
switch means in said casing means operable to control energisation of said drive motor means,

second casing means shaped as a handle,

knifeblade means,

transmission means in said second casing means adapted to apply a drive from said electric drive motor means to drive said knifeblade means,

switch control means on said second casing means, and



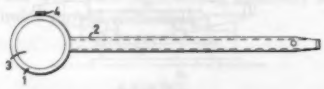
means releasably coupling said first casing means with said second casing means, said electric drive motor means with said transmission means, and said switch means with said switch control means.

4,164,814

PERSONAL USE DEVICE FOR REMOVING TARTAR FROM THE INNER SIDE OF TEETH

Bernt Klostermark, Smedsbacksgatan 3B, 115 39 Stockholm, Sweden

Filed Jul. 28, 1977, Ser. No. 819,983
Claims priority, application Sweden, Aug. 6, 1976, 7608825
Int. Cl.[2] A61C *3/00, 15/00*
U.S. Cl. 32—69 **7 Claims**



1. A combination mirror and tooth scraper for use as a personal dental care device for removing tartar from the inner side of a teeth row comprising a dentist mirror with mirror frame and handle, an elongate flat tooth scraper made from stiff and slight resilient material secured on the frame adjacent the edge of and projecting up above the plane of the mirror, said tooth-scraper planar from being substantially perpendicular to the plane of the mirror.

4,164,815

DEVICE FOR MEASURING A HUMAN FOOT

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed May 5, 1977, Ser. No. 793,935
Claims priority, application France, May 6, 1976, 76 13596
Int. Cl.[2] A43D *1/02*
U.S. Cl. 33—3 A **12 Claims**

1. A device for obtaining information regarding at least one dimension of a human foot, more particularly for the purpose of selecting a boot suitable for said foot, comprising

(a) a rigid trihedral support structure having a substantially horizontal and two substantially vertical planes forming reference faces for placement of the foot to be measured in a fixed position, said reference faces defining between them an interior face of said structure;

(b) a passage within at least one of said faces of said structure adjacent to the position of the heel of said foot when in position to be measured, said passage opening in said interior space of said structure; and

(c) means for connecting at least one measuring element to said structure by one of its ends adjacent the intersection of said three planes;

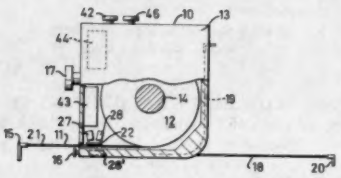
(d) the opening of said passage within the interior space of said structure being located adjacent the point of connection of said measuring element to said structure and the other end of said measuring element being free for sliding movement within said passage.

4,164,816

ELECTRONIC MEASURING TAPE

Lars A. Bergkvist, Gottne, 890 42 Mellansel, Sweden

Filed Oct. 11, 1977, Ser. No. 840,849
Claims priority, application Sweden, Oct. 15, 1976, 7611512
Int. Cl.[2] G01B *3/10*
U.S. Cl. 33—139 **9 Claims**



1. An electronic measuring device for indicating the measured length between two fixed points, said device comprising, a housing, a flexible measuring tape retained in the housing coiled upon a spool and adapted for movement of a free end of the tape from a first position in the housing to a second position with the free end and a portion of the tape extended from the housing, the tape being extended between said two points when in said second position with the free end positioned adjacent one of said fixed points and the housing positioned adjacent the other of said fixed points, a first screen provided on the tape for movement therewith and a second stationary screen mounted in the housing overlying the first screen, said screens carrying a series of indicia lines to produce a moire interference pattern as the first screen is moved on the tape with respect to the second screen, means for reading the moire interference pattern including illumination means positioned adjacent the second screen for illuminating the moire pattern as it is produced by movement of the tape between said two points and a phototransistor positioned adjacent the second screen for detecting the moire pattern produced and generating an electrical signal in response thereto, calculator and display means positioned in the housing to receive the signal from the phototransistor and display the measured length defined by the tape as the free end thereof is moved between said two points, and a measuring tongue attached at one end to the housing and adapted for movement of a free end of the tongue from a first position adjacent the exterior of the housing to a second position with the free end extended from the housing, the tongue being extended for measuring a length between third and fourth fixed points when in the second position with the free end positioned adjacent the third fixed point and the housing positioned adjacent the fourth fixed point, means for indicating that the measuring tongue is in the second position, and said calculation and display means being coupled to the indication means and adapted to add the length measured by the measuring tongue to the length measured by the measuring tape.

4,164,817

CONDUIT BENDING LEVEL

Thomas G. Walker, E. Union Lake, Mich., assignor to JDS Products, Inc., Hartland, Mich.

Filed May 4, 1978, Ser. No. 902,676
Int. Cl.[2] G01C *9/34*
U.S. Cl. 33—371 **7 Claims**

1. A level for use in bending conduit having a conduit end opening within a preselected nominal dimension range comprising an axially tapering body of resilient material having a cross-sectional dimension at one axial end which is below said preselected range and a cross-sectional dimension at the other axial end which is above said range such that said body is constructed to be axially telescopically received and retained by force-fit within a conduit end opening at a point along the axial dimension of said body which corresponds to the dimension within said range of the said end opening, and a spirit level mounted in fixed position on said body adjacent said other axial end to be disposed externally of the said conduit end opening when said body is retained therein for indicating orientation of the conduit end during a conduit bending operation wherein upon engagement of said tapered body portion in a conduit, additional axial pressure will force the engaged body portion resiliently into said conduit to retain this position during conduit bending operations.

4,164,818

METHOD FOR PREVENTING ADHESIVENESS OF A HYDROGEL OF A WATER-SOLUBLE ACRYLAMIDE-TYPE POLYMER

Iwao Ohshima; Yukio Shibuya, and Hisao Otani, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Oct. 20, 1977, Ser. No. 843,913
Claims priority, application Japan, Oct. 20, 1976, 51/125007
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—12 **7 Claims**

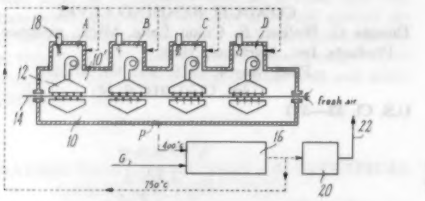
1. A method for preventing the surface of a hydrogel of a water-soluble acrylamide-type polymer from being tacky, which comprises coating the surface of said hydrogel with a member selected from the group consisting of a higher fatty acid, an alkali metal salt of a higher fatty acid and mixtures thereof.

4,164,819

PAINT DRYING OVEN

Roger Devillard, Paris, France, assignor to Heurtey Metallurgie, Paris, France

Filed Nov. 1, 1977, Ser. No. 847,620
Claims priority, application France, Nov. 5, 1976, 76 33392
Int. Cl.[2] F26B *21/06*
U.S. Cl. 34—72 **6 Claims**



1. An apparatus for drying paint on metal strips, said apparatus comprising:

an elongated oven having at opposite ends thereof inlet and outlet openings for the entrance and discharge, respectively, of a painted metal strip continuously moving through said oven;

the interior of said oven, between said opposite ends thereof, including plural heating sections through the volumes of which said painted metal strip sequentially passes;

each said heating section having therein a separate blower means for directing a gaseous mixture within the said volume of the respective said heating section against said painted metal strip, and for thereby drying said painted metal strip and evaporating solvents from the paint, whereby said solvents are released in gaseous form into said gaseous mixture in said volume;

means for withdrawing from said interior of said oven a portion of the gaseous mixture therein, including said gaseous solvents;

means for passing a first quantity of said withdrawn gaseous mixture, without any preliminary incineration thereof, directly to at least one first incinerator means directly mounted on said oven for thereby incinerating said gaseous solvents of said first quantity to form combustion gas, the discharge of said first incinerator means being in direct communication with at least one of said heating sections, to thereby discharge said combustion gas directly into the said volumes thereof, such that said gaseous mixture directed by the said blower means thereof includes said combustion gas;

means for passing a second quantity of said withdrawn gaseous mixture directly to a second incinerator means, located separate from and external of said oven, for thereby incinerating said gaseous solvents of said second quantity, whereafter said second quantity may be discharged to the atmosphere; and

means associated with said oven for introducing into said interior thereof a quantity of air to compensate for said second quantity discharged to the atmosphere.

4,164,820

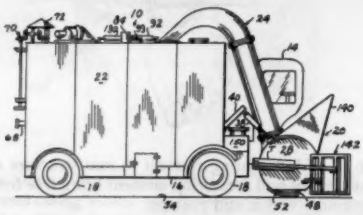
SNOW REMOVER AND VACUUM SWEEPER

Eli G. Krickovich, P.O. Box 106, Clinton, Iowa 52732

Filed Apr. 24, 1978, Ser. No. 899,513
Int. Cl.[2] E01H *5/10*
U.S. Cl. 37—12 **9 Claims**

1. In a roadway cleaning apparatus including an engine mounted on a vehicle chassis having an upright tank thereon, rotatable screw conveyor means including a horizontal conveyor housing having a snow pickup helical conveyor disposed horizontally within and journalled by the conveyor housing adjacent the surface of a roadway at the forward end of the chassis, tubing means connecting said screw conveyor means with an inlet port in the top of the tank for discharging snow thereinto, an engine operated control means including an engine driven hydraulic fluid pump and a hydraulic conveyor driving motor drivably connected with said helical conveyor and an electric current generating means, the improvement comprising:

means for maintaining the interior of said tank at a desired temperature,



said means including a return bend tube having an intermediate portion and having end portions communicating with the interior of said tank through openings formed in one of its walls, means for forming a forced air draft of a portion of the air contained by said tank through said return bend, and means for heating the forced draft of air;

sliding panel means for opening and closing one said tube end portion; and,

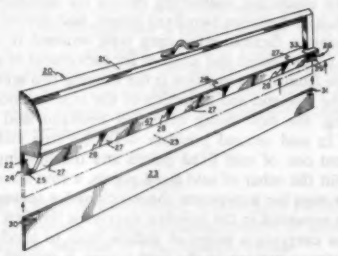
means for moving said sliding panel means.

4,164,821

SNOW PLOW BLADE ATTACHMENT SYSTEM

Andre H. Vanchot, 65 Marshall La., Derby, Conn. 06418

Filed Nov. 11, 1977, Ser. No. 850,688
Int. Cl.[2] E02F *3/76*
U.S. Cl. 37—141 R **10 Claims**



9. A snow plow blade support assembly for mounting to the mouldboard of a plow body and securely holding and supporting a snow plow blade installed therewith, comprising:

(A) a downwardly opening elongated blade nesting and engaging channel

(B) a blade camming and securing member

(a) mounted within and inwardly of one end of the channel in substantial planar alignment therewith, and

(b) incorporating a longitudinally, downwardly extending surface for cooperative sliding and upward camming and holding engagement with a portion of the plow blade; and

(c) a blade engaging and locking member mounted on the other end of the channel and incorporating

(1) a movable arm secured to said assembly positioned for cooperative locking engagement with the plow blade, and

(2) position securing means engageable with the mov-

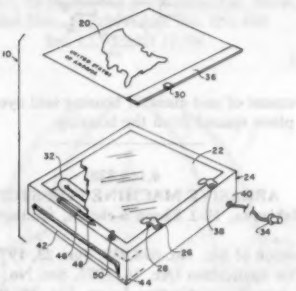
able arm and the support assembly for securely locking the arm in its blade engagement position.

4,164,822

PORTABLE MAP READING SYSTEM

James L. Batton, 7101 Dunshire Way, Apt. 4C, Baltimore, Md. 21222

Filed Jan. 4, 1978, Ser. No. 866,860
Int. Cl.[2] G02B *27/02*
U.S. Cl. 40—361 **14 Claims**



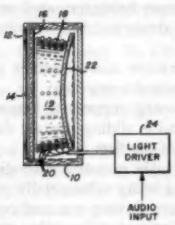
1. In a portable map display system having map structure, a light box with translucent panel and light source for illuminating the map structure, and, associated with the map structure, means for actuating the light source, the improvement comprising: the means for actuating including first and second electrodes in spaced locations on the light box proximate the translucent panel and a conductive strip on the map structure located in position for electrically connecting the first and second electrodes when the map structure is in viewing coincidence with the translucent table, and means for preventing mis-orientation of the map structure on the light box comprising: said first and second electrodes having asymmetrical location on the lightbox relative to the translucent panel, said map structure having a shape substantially corresponding to the translucent panel and the conductive strip having asymmetrical location on the map structure corresponding to the location of the electrodes relative to the translucent panel.

4,164,823

LUMINOUS EFFECTS DEVICE

Joseph J. Marsico, 1229 Newberry Ave., LaGrange, Ill. 60525

Filed Mar. 22, 1976, Ser. No. 669,235
Int. Cl.[2] G09F *13/12, 19/16*
U.S. Cl. 40—427 **10 Claims**



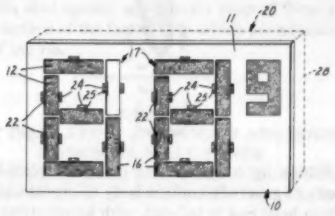
1. A luminous effects device comprising:
means forming a housing closed on all but one side;
a first reflector means disposed within said housing and having its reflective side facing the open side of said housing;
a light means carrying member having a continous inside wall forming a frusto-conical section circumscribing a central region enclosed by said housing and having a first opening of a first diameter disposed adjacent said first reflector means, and a second opening of a second diameter which is larger than said first opening;
light means affixed to said carrying member and disposed proximate said inside wall; and
a partially silvered, partially transpartent second reflector means disposed adjacent said second opening and serving to close the open side of said housing, whereby light from said light means reflected back and forth between said first reflector means and said second reflector means creates an illusion of depth when viewed through such second reflector means.

4,164,824

CHANGEABLE CHARACTER SIGN STRUCTURE

James G. Nidelkoff, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 756,258, Jan. 3, 1977, Pat. No. 4,115,936.
This application Jul. 14, 1978, Ser. No. 924,624
Int. Cl.[2] G09F *9/32*
U.S. Cl. 40—450 **5 Claims**



5. A sign structure having changeable characters, comprising:
a sign face of a predetermined color and having a patterned array of openings;
shutters mounted to said sign face, one to an opening, each of said shutters having a plate mounted for sliding movement between a first and second position, at least a first surface portion of each shutter being of a predetermined color which is the same as, or contrasts with, the sign face color, and each shutter being movable between said first position for displaying said first surface portion in said opening and said second position wherein said first surface portion is not visible at said opening; and
latch means for securing said shutters in said first or second position.

4,164,825

DEVICE FOR REDUCING FIREARM RECOIL

Louis C. Hutchison, 5860 W. Edna, Las Vegas, Nev. 89102

Filed Apr. 21, 1978, Ser. No. 898,847
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—1 V **17 Claims**

1. A firearm recoil reducing device comprising
a case enclosing an elongated interior chamber,
a piston received in said chamber having a plurality of vanes along the exterior surface thereof and supported between a front and a rear spring, and

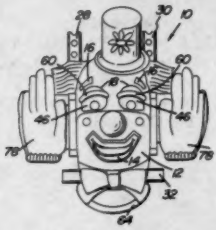
a liquid substantially filling said chamber.

4,164,826
SALMON JIG
Phares H. Metzler, 11200 - 15th SW., Seattle, Wash. 98146, and Norman P. Metzler, 501 E. 10th St., Port Angeles, Wash. 98362
Filed Jun. 26, 1978, Ser. No. 919,410
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.05 **6 Claims**

1. A fishing jig comprising an elongated plate-like heavy-metal body of generally uniform body thickness and tapered in width from head end to tail end, with longitudinal edges convexly rounded, with head end width at least approximately twice tail end width and at least approximately a few times body thickness, with said body terminating at its head end in a transverse substantially flat head end face angled obliquely at approximately 45° both to the general body plane and to a longitudinal plane perpendicular to said body plane, a longitudinal line-receiving open bore in said body extending from a port in the tail end to an opposite port in the head end, the latter port being located transversely inwardly from the longer longitudinal edge of the body by approximately one-fourth to one-third the width of the body at the head end and at a position relatively closely adjacent to the intersection of the head end face and the side of the body adjacent the lagging edge of said head end face, said body having an arcuate bend therein of approximately 20° transverse to the body plane, said bend occurring at a location approximately one-third of the length of the body forwardly of its tail end.

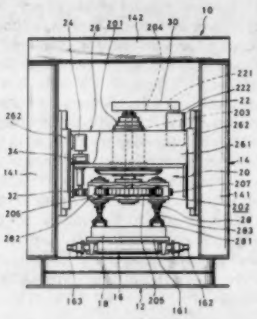
4,164,827
ACTION TOY
Nunzio Palumbo, Hackensack, N.J., assignor to Kohner, Inc., New York, N.Y.
Filed Oct. 31, 1977, Ser. No. 846,968
Int. Cl.[2] A63H *11/00*
U.S. Cl. 46—119 **15 Claims**

1. An action toy, comprising:
a housing having at least one eye-shaped opening,
a member bearing an eye-shaped design, said member being disposed within said housing in juxtaposition with said opening,
at least one hand-shaped member rotatably mounted on said housing, and
motive means connected to said member bearing said eye-shaped design, said motive means being disposed in operative relation with said hand-shaped member for causing simultaneous reciprocating rotational movement of said hand-shaped member and reciprocating translational



movement of said member bearing said eye-shaped design in a plane spaced from the housing.

4,164,828
ABRASIVE MACHINE FOR STONES
Hiroshi Ishizuka, 19-2 Ebara 6-chome, Shinagawa-ku, Tokyo, Japan
Continuation of Ser. No. 698,959, Jun. 23, 1976, abandoned. This application Dec. 14, 1977, Ser. No. 860,630
Claims priority, application Japan, Jun. 26, 1975, 50/80234
Int. Cl.[2] B24B *7/22*
U.S. Cl. 51—110 **3 Claims**



1. An abrasive machine for grinding a work-piece comprising:
a base member;
a frame structure including a pair of vertical side members and a top member securely mounted on top ends of the vertical side members;
said frame structure being mounted on said base member;
means arranged above said base member for feeding a work-piece;
at least one abrasion unit which is positioned above the feeding means and comprises:
(i) a first housing supported between the vertical side members and in sliding contact therewith for adjusting the height of the first housing;
(ii) a central axis member extending through the first housing and being substantially parallel to the vertical side members, having one end connected to an output shaft of a first motor through a transmission means and having the other end securely connected to a main gear;
(iii) said central axis, first motor and transmission means being mounted on said first housing;
(iv) a second housing which encases the main gear and a plurality of smaller gears arranged in mesh and concentric with the main gear, each of said plurality of smaller gears being rotatably mounted on an axle journaled in the second housing, said axles being restricted from

longitudinal movement and said second housing includes an annular rack in mesh with a pinion connected to an output shaft of a second motor for revolution of the smaller gears about the central axis of the main gear, each of said smaller gears carrying an abrasive tool with a grindstone detachably mounted thereto and

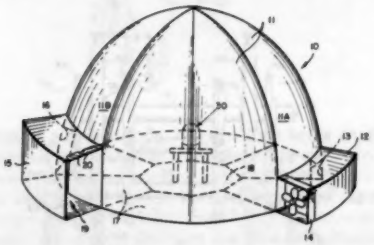
said first and second housings being vertically adjustable as a unit.

4,164,829

INFLATABLE STRUCTURE

Philip M. Sadler, 93 Hammond St., Cambridge, Mass. 02138

Filed Nov. 14, 1977, Ser. No. 851,432
Int. Cl.[2] E04G *11/04*
U.S. Cl. 52—2 **14 Claims**



1. A self-supporting flexible structure comprising

a chamber-forming assembly including a plurality of flexible panels made substantially entirely of extensible material capable of deformation into a concave shape, said panels being attached in a manner such that, when inflated, said assembly is capable of assuming a generally hemispherical shape;

a first one of said panels having a first opening therein;

a first channel means made substantially entirely of extensible material and attached to said first one of said panels to permit the introduction of air under pressure greater than atmospheric pressure through said first opening so as to inflate said assembly and to form a generally hemispherically shaped chamber;

a second one of said panels having a second opening therein;

a second channel means made substantially entirely of extensible material and attached to said second one of said panels to permit the exit from said chamber through said second opening of a controllable volume of air that has been so introduced into said chamber and further, when inflated, providing entry and exit means for said chamber.

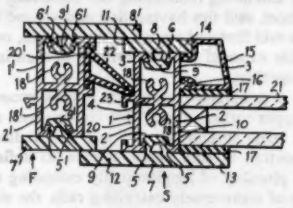
4,164,830

DOUBLE-GLAZED DOORS OR WINDOWS AND FRAME ASSEMBLIES THEREFOR

Johannes H. Bierlich, Oresundshoj 15, Charlottenlund, Denmark

Filed Dec. 16, 1977, Ser. No. 861,494
Int. Cl.[2] E04C *2/38*
U.S. Cl. 52—398 **8 Claims**

1. A door or window comprising at least two panes of glass secured, with an air gap therebetween, in a generally rectangular frame constructed of a plurality of frame members which are joined together at the corners of the frame and are each assembled from metal and thermally insulating components to impede heat transference through the thickness of the frame member between its inner and outer surfaces, characterised in that each frame member assembly comprises a metal extrusion having a cross-section comprising spaced apart walls extending in the direction substantially perpendicular to the panes of glass for the major part of the thickness of the frame member, and defining at least one open channel having two integral side walls and an end wall and having oppositely facing abutments along the inside surfaces of the opposing channel side walls adjacent the free edges thereof, and a facing strip extruded from a substantially rigid thermal-insulating material with a cross-section including front and rear surfaces and an integral substantially rigid rib which extends along said rear surface and which is profiled with oppositely facing recesses which fit between and interlock with the opposing pair of abutments of



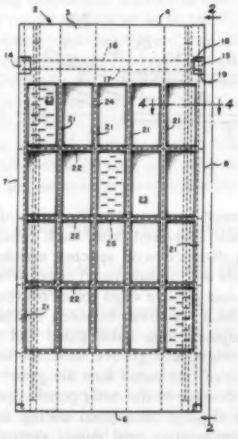
the channel to hold the facing strip bridging the free edges of the channel side walls with a marginal edge zone of the strip projecting laterally beyond a side wall of the channel, said recesses being of a width such that the free edges of the channel side walls abut against and directly support those portions of the rear surface of the facing strip which are adjacent opposite sides of the rib.

4,164,831

HEAT INSULATING AND SOUND ABSORBING CONCRETE WALL PANEL

William E. Messick, 1445 S. Bascom Ave. #53, San Jose, Calif. 95128, and Bernard L. Gabrielsen, 5858 Pilar Ct., San Jose, Calif. 95120

Filed Sep. 21, 1977, Ser. No. 835,318
Int. Cl.[2] E04B *2/00*
U.S. Cl. 52—405 **6 Claims**



1. A massive concrete wall panel having thermal insulating and sound absorbing characteristics, comprising:

a first facing sheet formed of poured, molded concrete, said first sheet being generally rectangular in shape and having upper and lower surfaces defined by transversely extending top and bottom edges and longitudinally extending first and second lateral edges;

first and second spaced longitudinal ribs integrally formed with said lower surface of said first facing sheet, said ribs being located adjacent said first and second lateral edges,

respectively, said ribs being formed to provide the vertical load-bearing strength of said wall panel;

truss-form reinforcing bars embedded within each of said first and second ribs;

reinforcing wire matt means embedded in said first facing sheet;

first and second typing recesses formed at said first and second lateral edges;

transversly extending reinforcing ties embedded in said first facing sheet, said ties having first and second ends terminating in said first and second tying recesses, respectively, to provide exposed tie ends for use in securing adjacent panels together;

a plurality of generally rectangular hollow recesses formed in said upper surface of said first facing sheet, said hollow recesses being spaced laterally and longitudinally over a major portion of said upper surface to define therebetween a plurality of longitudinally extending studs and a plurality of transversely extending rails, the side surfaces of said studs and rails being tapered to provide tapering side walls for said hollow receses;

reinforcing bars embedded in said studs and said rails;

a first rectangular block of thermally insulative material secured in each said hollow recess;

a second rectangular block of sound absorbing material secured in each said hollow recess, said first and second blocks being coextensive with said recesses, with one block being superimposed on the other; and

cover means engaging said upper surface of said wall panel first facing sheet to retain said first and second blocks.

4,164,832

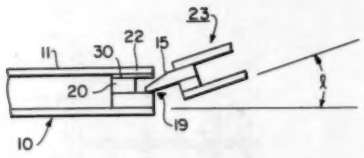
TONGUE AND GROOVE STRUCTURE IN PREFORMED WALL SECTIONS

Alex Van Zandt, Rte. 5, Ada, Okla. 74820

Filed Mar. 31, 1978, Ser. No. 892,158

Int. Cl.[2] E04C *1/10*

U.S. Cl. 52—593 **3 Claims**



1. The improved preformed wall section of the type having two outer panels separated from each other by a predetermined spacing distance with spacing members disposed between the panels on opposite panel edges wherein the spacers define tongue and groove edge joints on respective opposite panel edges which are offset between the panel spacing distance to lie adjacent one outer panel and including in the interlockable tongue and groove structure means for interfitting the tongue of one panel into the groove of an adjacent panel without damage to the outer panel edge at the groove if the panels are slightly misaligned during interfitting of the tongue into the groove, said means comprising a stiffener member located on the inner surface of the outer panel within said groove.

4,164,833

SKIP-SEAL MECHANISM FOR PACKAGING MACHINE

Henry E. Todd, Cedarburg, Wis., assignor to Pratt Manufacturing Corp., Milwaukee, Wis.

Filed Feb. 9, 1978, Ser. No. 876,392

Int. Cl.[2] B65B *9/02, 51/14, 51/16, 51/26*

U.S. Cl. 53—545 **11 Claims**

3. A device for producing pressure effected longitudinally extending seals and for periodically omitting seals between continuously longitudinally moving webs, comprising:

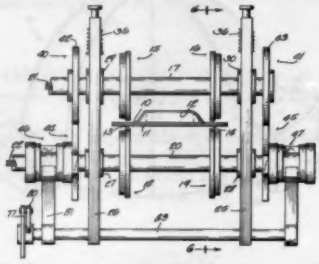
first and second shaft means having their rotational axes in parallel, at least one of said shaft means being movable toward and away from the other,

sealing wheel means on said respective shaft means for said webs to pass between them to effect a seal of predetermined length when the preipheries of said wheels are close to each other and to omit a seal when said peripheries are away from each other,

means for biasing said first shaft means toward said second shaft means,

a circular cam follower fixed coaxially on said first shaft means,

a cam on said second shaft means for cooperating with said follower, said cam having a plurality of angularly spaced



apart radially extending lobe means each of which has a circular peripheral surface having a radius from the axis of said second shaft means substantially equal to the radius of said follower means, said lobes defining angularly spaced apart recesses between them,

clutch means operative to couple said second shaft means in driving relation with said cam to thereby rotate said lobe means successively into contact with said cam follower to cause said first shaft means to move away from said second shaft means and separate said wheel means to effect omission of a seal and operative to uncouple said cam means from said second shaft means when said cam means has rotated to the angle of a recess to thereby permit said first shaft means to move toward the second shaft means to effect a seal, and

means for operating said clutch means.

4,164,834

JUNIOR STIRRUPS ATTACHMENT FOR ADULT-SIZE SADDLE

George L. Christensen, 624 N. 1st West, Tremonton, Utah 84337

Filed Oct. 4, 1976, Ser. No. 729,188

Int. Cl.[2] B68C *1/16*

U.S. Cl. 54—46 **4 Claims**

1. A junior stirrups attachment for an adult-size, stirrups-equipped, horse saddle, comprising:

a flexible main strap having the general form of a thin, flat, elongated rectangle;

a junior-size stirrup attached to each end portion of the main strap with a loop formed by doubling the end portion of the main strap upon itself to include the bolt of the stirrup within the loop and closing the loop by a fastening means; and

means for fastening the main strap to the forward portion of an adult-size saddle so that the main strap lies across the adult-size saddle at right angles thereto, with equal end portions of the main strap suspended from the saddle on either side thereof, whereby a child rider can sit on the seat of the adult-size saddle, together with an accompanying adult, and the need for a special, piggyback, junior-size, saddle seat is eliminated, said fastening means com-

prising a first loop formed by an elongated piece of strong, flexible material attached at each of its ends to the forward edge of the central portion of the main strap, a second strap fixed at one end to the same edge of the central portion of the main strap, and fastening means fixed adjacent the juncture of the second strap with the main strap so that the second strap can be fastened thereby into the

form of a second loop, the first loop being capable of fastening the main strap to the adult-size saddle by being passed through an opening under the pommel and over the saddle horn thereof, the first loop being capable of being secured to the saddle horn by the second strap being passed through the first loop and then being fastened by the fastening means adjacent the juncture of the second strap with the main strap to form a loop.

4,164,835

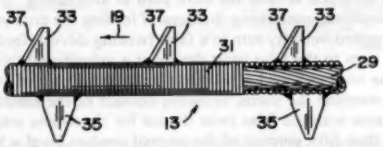
GRASS CUTTER

Joseph Conte, 3740 Davis Blvd., Sarasota, Fla. 33580

Filed Sep. 9, 1977, Ser. No. 831,766

Int. Cl.[2] A01D *55/24*

U.S. Cl. 56—291 **16 Claims**



1. A cutting device comprising in combination,

an endless cutting member,

said endless cutting member comprising an endless inner cable means;

a helical outer coil means helically wound about the outer circumference of said inner cable means enabling limited movement therebetween;

a plurality of cutting element means secured only to said helical coil means;

said endless cutting member being disposed about a drive means; and

power means connected to said drive means for moving said endless cutting member with said limited movement between said inner cable means and said outer coil at least partially absorbing the shock produced by said cutting element means during the cutting action.

4,164,836

BULKY YARN PRODUCING APPARATUS

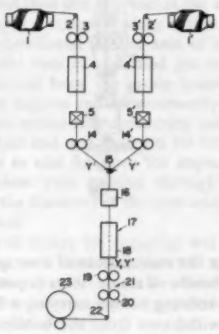
Fumio Tanae, Iyo, and Hirokazu Matsuoka, Matsuyama, both of Japan, assignors to Teijin Seiki Company Limited, Osaka, Japan

Filed May 31, 1978, Ser. No. 911,220

Claims priority, application Japan, Jun. 9, 1977, 52/68174; May 18, 1978, 53/59357

Int. Cl.[2] D02G *1/02, 3/00, 3/34*

U.S. Cl. 57—2 **7 Claims**



1. A bulky yarn producing apparatus comprising in combination:

a twisting zone along a yarn travelling path, a twist mechanism in said twisting zone for twisting and untwisting a yarn; a rubbing mechanism located in said twisting zone and having a rough surface so as to rub filaments of the yarn for imparting scratches thereto, said rubbing mechanism being disposed relative to said twist mechanism so as to rub the yarn while the yarn is in a twisted state,

a stretching zone disposed along a portion of said yarn travelling path downstream of said twisting zone where the yarn is in an untwisted state, a stretching mechanism disposed in said stretching zone to stretch the yarn so that the filaments are severed at their scratches to produce a bulky yarn.

6. A bulky yarn producing apparatus comprising in combination:

a twist mechanism provided on a yarn travelling a path for twisting and untwisting a yarn;

a rubbing mechanism provided on said yarn travelling path of said yarn which is twisted by said twist mechanism and having a rough surface so as to rub filaments constituting said yarn for imparting scratches thereto; and a stretching mechanism provided on the downstream of said rubbing mechanism along said yarn travelling path of said untwisted yarn to stretch said yarn so that said filaments are severed at their scratches to produce a bulky yarn;

said twist mechanism comprising three rotary shafts equispacedly arranged in parallel relation with each other and three friction discs each secured to each of said rotary shafts in such a manner that said friction discs are disposed in partly overlying and axially spaced relation with each other and extend in parallel planes different from each other; said rubbing mechanism comprising a rubbing disc secured to one of said rotary shafts to be disposed above said friction rollers and formed with said rough surface on its periphery.

4,164,837

METHOD OF FORMING A WRAPPED YARN

Fritjof Maag, Kelkheim, and Friedrich Unger, Lorsbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 585,607, Jun. 10, 1975, Pat. No. 4,018,042. This application Dec. 20, 1976, Ser. No. 752,436

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1974, 2428483

Int. Cl.[2] D02G *3/38, 3/02*

U.S. Cl. 57—3 **9 Claims**

1. A process for the manufacture of a wrapped yarn of the type in which a bundle of staple fibers is passed through the hollow shaft of a rotating bobbin carrying a filamentary yarn and the yarn is withdrawn from the bobbin and led to the longitudinally moving fiber bundle, whereby rotation of the bobbin causes the fiber bundle to be wrapped with the filamentary yarn in a helical configuration, said process comprising the steps of winding said fiber bundle with a filamentary yarn having (a) a denier of 1 to 50 dtex, (b) an elongation at break greater than the elongation at break of the fibers of said bundle, whereby when the yarn is stretched the winding yarn does not break until after the core fibers break and (c) a modulus such that a force of at least 10 grams is required to produce an elongation of 4% and maintaining a tension of no more than 5 grams on said winding yarn during said winding operation, whereby the core fibers are rapidly squeezed together by the winding yarn when wrapped yarn is stretched.

4,164,838

PROCESS FOR THE PRODUCTION OF SYNTHETIC ENDLESS FILAMENTS WITH GOOD CRIMPING PROPERTIES

Hans Bach, Dormagen; Karl-August Heinroth; Hans-Dieter Jurischka, both of Dormagen-Horrem; Hans Kaloff, Zons, Neuss; Rudolf J. Klee, and Herbert Schmidt, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1974, Ser. No. 530,445

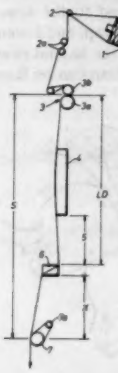
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1973, 2360707

Int. Cl.[2] D02G *1/02*

U.S. Cl. 57—247 **6 Claims**

1. A process for the stretch-texturing of high-molecular-weight, linear synthetic endless filaments travelling at speeds of from 300 to 1200 meters per minute at the stretching godet by the false-twist method by continuously guiding the filaments through a delivery zone, a heat-fixing zone, 30 to 70 cm. long between the delivery stage and the twister inlet, a false-twister and a stretching godet, wherein the filaments are passed through a stretching zone S 55 to 180 cm. long, defined by the distance between the delivery stage and the stretching godet, at a speed of from 300 to 1200 m/m, the distance between the delivery stage and the false-twister inlet amounting to S-X cm. and the distance X between the false-twister outlet and the stretching godet being from 5–30 cm.

5. Simultaneously stretched and textured polyamide filaments produced by the process of claim 1 with a snarl factor of



less than 0.1/kg for a strength of greater than 42 cN/tex and a deviation in cold-water shrinkage of at most 15%.

4,164,839

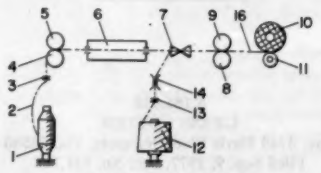
YARN PROCESS

Udo P. Schweizer, Charlotte, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 30, 1978, Ser. No. 873,758

Int. Cl.[2] D02G *3/38*

U.S. Cl. 57—293 **7 Claims**



1. A method of making a sheath/core yarn, wherein a sheath yarn is wrapped around the core yarn in alternating "S" and "Z" directions, comprising the steps of feeding the core yarn at a determined velocity rate to a false twisting device, feeding a sheath yarn to the false twist device at a velocity rate greater than the core yarn and at an angle to the core yarn of at least 15° to combine the yarns, reducing contact of the sheath and core yarns with the false twist device for short-time intervals to less than fifty percent of the normal contact level wherein the ratio of the number of reductions in contact with the falsetwisting device per minute to the velocity of the core yarn in meters per minute is between about 10:1 and 350:1, removing the sheath and core yarns from the falsetwist device and thereafter winding the combined yarns into a package.

4,164,840

METHOD AND APPARATUS FOR TWISTING YARNS

Kurt C. Chilpan, Seneca, S.C., and William L. Lewis, Sanford, N.C., assignors to Roberts Company, Sanford, N.C.

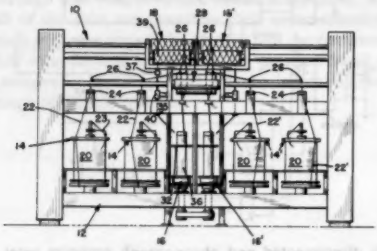
Continuation of Ser. No. 490,580, Jul. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 326,006, Jan. 23, 1973, abandoned. This application Jan. 14, 1976, Ser. No. 648,771

Int. Cl.[2] D01H *7/90, 1/10, 7/86*

U.S. Cl. 57—313 **8 Claims**

1. A machine for twisting and plying yarns comprising: a support frame, a plurality of two-for-one spindle assemblies

mounted upon said support frame, a yarn supply package mounted upon each two-for-one spindle assembly, each two-for-one spindle assembly applying a twist to the yarn drawn therefrom, a plurality of spindle units, eacgh including a driven bobbin mounted upon said support frame, means for directing the individually twisted yarns from said two-for-one spindle assemblies toward a bobbin positioned upon a first spindle unit,



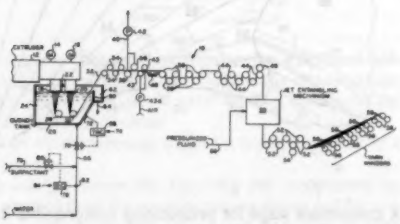
said spindle unit plying and downtwisting the yarns onto said bobbin to form a package, a yarn winder assembly mounted upon said support frame, means for directing the yarns from said bobbin, upon completion of the formation of said package, to said yarn winder assembly, said driven bobbin applying additional twist to the yarn being unwound from the full package and being directed to said winder assembly.

4,164,841

METHOD AND APPARATUS FOR CONTINUOUS FORMATION OF BULKED AND ENTANGLED MULTIFILAMENT YARN

David E. Borenstein, Greenville, S.C., and Jack A. Banning, Rocky Mount, N.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 3, 1977, Ser. No. 838,799
Int. Cl.[2] D02G *1/16*
U.S. Cl. 57—350 **30 Claims**



1. Apparatus for continuously forming bulked and entangled multifilament melt-spinnable plastic yarn, comprising:

filament extrusion means for extruding a melt-spinnable plastic material in molten form through a plurality of spinning orifices in at least one spinneret die to form a plurality of filaments of a multifilament yarn;

filament quench means disposed adjacent to said at least one spinneret die for quenching the molten filaments extruded therefrom, said filament quench means comprising a body of quench liquid disposed adjacent to said at least one spinneret die, the surface of said quench liquid and said spinneret die being spaced apart to define an air gap therebetween;

means for passing the molten filaments from said at least one spinneret die into said filament quench means;

feed roll means for engaging and withdrawing the quenched filaments of the multifilament yarn from said filament quench means at a first linear velocity;

draw roll means for engaging and withdrawing the filaments of the multifilament yarn from said feed roll means at a second linear velocity greater than said first linear velocity to draw the filaments of the multifilament yarn;

filament entangler means disposed adjacent to said draw roll means for entangling the filaments of the multifilament yarn, said filament entangler means comprising:

a source of pressurized fluid;

a substantially cylindrically shaped passage having a longitudinal axis through which the multifilament yarn passes from said draw roll means;

two fluid jets communicating with said passage with the axis of each of said fluid jets being aligned substantially perpendicular to the axis of said passage and with the axes of said fluid jets intersect at the axis 4 said passage and lying in a common plane which plane is substantially perpendicular to the axis of said passage, and wherein the axes of said fluid jets define an included angle selected from the group consisting of approximately 60 degrees and approximately 120 degrees; and

fluid conduit means interconnecting said source of pressurized fluid and said fluid jets for conducting pressurized fluid to said fluid jets for impingement upon the multifilament yarn passing through said passage to entangle the filaments of the yarn and increase the bulk thereof; and

second feed roll means for engaging and withdrawing the multifilament yarn from said draw roll means and through said filament entangler means at a third linear velocity.

11. A continuous process for forming bulked and entangled yarn comprising the steps of:

(a) extruding a melt-spinnable plastic material in molten form through the spinning orifices of at least one spinneret die to form a plurality of filaments;

(b) quenching said filaments in a quenching liquid;

(c) drawing the quenched filaments;

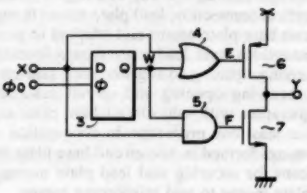
(d) impinging two fluid streams on the quenched and drawn filaments as they pass through a longitudinal confining yarn passage having a longitudinal axis therethrough so as to entangle the quenched and drawn filaments to impart bulk and entanglement to the filaments and form a bulked and entangled yarn.

4,164,842

BUFFER AMPLIFIER CIRCUIT

Heihachiro Ebihara, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1977, Ser. No. 824,603
Claims priority, application Japan, Aug. 20, 1976, 51-99419
Int. Cl.[2] G04C *3/00*; H03K *19/08*
U.S. Cl. 58—23 A **8 Claims**



1. A buffer amplifier circuit comprising an electric power source having a high potential side and a low potential side, a P-channel MOS transistor having a gate, a drain and a source, said P-channel source connected to a high potential side of said electric power source, an N-channel MOS transistor having a gate, a drain and a source, said N-channel source connected to a low potential side of said electric power source, said drains of both said transistors being connected in common and constituting an output of said circuit, and a wave form shaping circuit comprising a data-type flipflop having a data input, a clock input and an output, first gate means having a first input con-

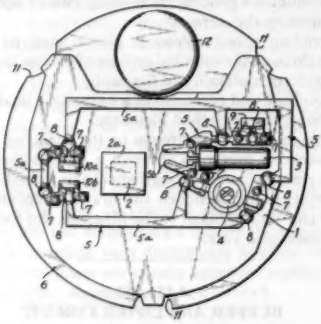
nected to said data input, a second input and an output connected to the gate of said P-channel MOS transistor, and second gate means having a first input connected to said data input and a second input, and an output connected to the gate of said N-channel MOS transistor, the second input of said first gate means and the second input of said second gate means being connected in common to said output of said flipflop, said flipflop being operated to change the level at said output thereof when supplied with each pulse of a clock signal at said clock input whereby said N-channel MOS transistor becomes OFF prior to a time at which said P-channel MOS transistor becomes ON and said P-channel MOS transistor becomes OFF prior to a time at which said N-channel MOS transistor becomes ON thus preventing both said transistors from becoming ON at the same time and eliminating any threading currents.

4,164,843

METALLIC LEAD PLATE AND CIRCUIT STRUCTURE FOR AN ELECTRONIC WATCH AND METHOD OF ASSEMBLY

Motoyuki Fujimori, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 6, 1977, Ser. No. 839,866
Claims priority, application Japan, Oct. 6, 1976, 51/134475
Int. Cl.[2] G04B *37/00*
U.S. Cl. 58—23 R **7 Claims**



1. An electronic wristwatch comprising a watch case means formed with at least one opening, circuit structure means received in said watch case means, said circuit structure means comprising circuit base plate means having a thin film circuit deposited thereon and formed with at least one receiving opening and at least one cutting opening in a region of said circuit requiring electrical connection; lead plate means in registration with said circuit base plate means and adapted to provide said electrical connections, said lead plate means formed with at least one receiving opening to register with said circuit base plate means receiving opening and circuit case reinforcing means in registration with said circuit base plate means and formed with at least one projection in cooperation with said receiving openings formed in said circuit base plate means and lead plate means for securing said lead plate means and said circuit base plate means to said reinforcing means.

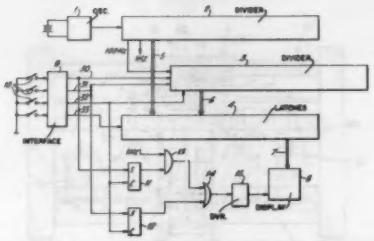
4,164,844

TIMEPIECE DISPLAY INDICATOR

Jean-Pierre Jaunin, Nidau, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Jul. 13, 1977, Ser. No. 815,398
Int. Cl.[2] G04F *8/00, 7/04*
U.S. Cl. 58—39.5 **11 Claims**

1. An electronic timepiece having control circuits arranged to drive a digital display so as to display selectively the passage of time (timepiece mode) or an interval of time (chronograph mode) said control circuits including a time standard, dividing means and storage registers adapted to provide signals pertaining to each mode, decoder-driver means and a plurality of control switches, there being provided an indicator comprising signal emitting means coupled to the control circuits in a manner to indicate by a first output state that the chronograph



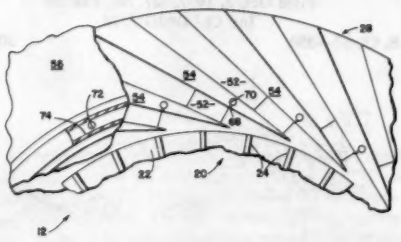
mode is disconnected and chronograph registers reset, by a second output state that counting in the chronograph mode is taking place and by a third output state that counting in the chronograph mode is stopped and that the registers remain set, the second and third output states being independent of which mode is being displayed.

4,164,845

ROTARY COMPRESSORS

John T. Exley, Milford; Charles Kuintzle, Jr., Monroe, and David L. Tate, Stratford, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Continuation-in-part of Ser. No. 515,115, Oct. 16, 1974, abandoned. This application May 9, 1977, Ser. No. 795,058
Int. Cl.[2] F01D *1/06, 9/04*
U.S. Cl. 60—39.29 **4 Claims**



1. A compressor stage for pressurizing compressible fluids, comprising:

a bladed radial flow impeller;

an annular radial flow diffuser having its inner periphery closely surrounding the discharge end of said impeller, said diffuser including a vaneless annular entrance space for receiving the fluid discharged from said impeller, said entrance space being formed by spaced apart walls, said diffuser also including a plurality of intersecting passageways extending outwardly from said annular entrance space in a tangential direction from the inner periphery of said diffuser, said passageways being formed by wedge-shaped vanes symmetrically disposed between said spaced apart walls, each of said passageways having a rectangular cross section, including a convergent entrance portion followed by a throat section of constant cross section downstream of which is an area of expanding cross section extending toward the exhaust end of each of said passageways; and

flow equalizing means for stabilizing the flow of fluid through said diffuser passageways, said flow-equalizing means including elongated transverse slots formed in the

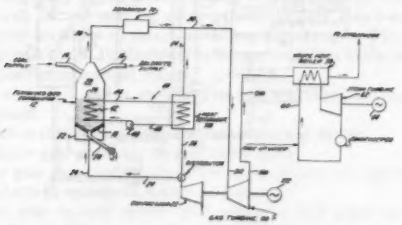
inward facing wall of each of said wedge-shaped vanes, said slot being located in the throat section of each of said passageways, the multiplicty of said slots being disposed along a line of equal pressure in said radial flow diffuser, a cavity in each of said vanes, each of said slots communicating with a respective one of said cavities, and a closed common manifold on one of said diffuser walls, each of said cavities communicating by means of openings through said wall with said common manifold, whereby all of the slots are placed in fluid communication with each other by way of the cavities and the common manifold thus serving to equalize the pressure in all of said passageway throat sections, thereby increasing the surge range of said compressor.

4,164,846

GAS TURBINE POWER PLANT UTILIZING A FLUIDIZED-BED COMBUSTOR

Seymour Moskowitz, Fort Lee, and Rossa W. Cole, E. Rutherford, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Nov. 23, 1977, Ser. No. 854,123
Int. Cl.[2] F02C *3/26*
U.S. Cl. 60—39.46 S **5 Claims**



1. A gas turbine power system having a fluidized-bed combustor for the burning of coal therein, the system comprising:

(a) a closed-loop, liquid-metal cooling system for the fluidized-bed combustor;

(b) an air compressing means for compressing air to a high pressure;

(c) conduit means for receiving the compressed air discharged from the air compressing means and for conducting such discharged compressed air in two streams, one stream thereof being conducted into said fluidized-bed combustor for fluidizing the bed and supporting combustion in the bed of the combustor and the other stream being conducted to the closed-loop cooling system;

(d) a gas turbine for driving a power generating means;

(e) discharge means connected to the fluidized-bed combustor for conducting the products of combustion from the fluidized-bed combustor to the gas turbine to drive the latter;

(f) said closed-loop, cooling system having means for circulating liquid metal in indirect heat exchange relationship with the fluidized-bed combustor so as to absorb heat from the latter and the heated liquid metal in indirect heat exchange with said other stream of compressed air to surrender heat to the latter; and

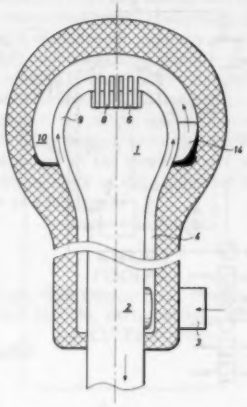
(g) a conduit means for conducting the heated compressed air from the closed-loop, liquid-metal cooling system to the discharge means and into admixture with the products of combustion at a point upstream from said gas turbine.

4,164,847

METHOD FOR COMBUSTION OF GASEOUS FUELS AND FLUE GASES

Svend B. Johansen, Calle Javier Vilanova 31, San Pedro de Premia, (Barcelona), Spain

Continuation of Ser. No. 308,842, Nov. 22, 1972, abandoned.
This application Mar. 4, 1976, Ser. No. 663,694
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—274 **6 Claims**



1. A method for the combustion of the exhaust gases from an internal combustion engine with air comprising feeding exhaust gas from an internal combustion engine and air along separate paths in heat exchange relation with one another towards a reaction chamber where combustion takes place and where heated products of combustion are conveyed for discharge, injecting said exhaust gas and said air into said reaction chamber to form a thin boundary layer therebetween, heating the exhaust gas and air in said separate paths by the heated products of combustion by heat exchange therewith such that the exhaust gas and air are each raised to a temperature of at least the ignition point of the gas-air mixture to cause a flameless surface combustion to take place in said thin boundary layer transmitting from said boundary layer additional combustion heat by respective heat exchange with the incoming gas and air immediately prior to and during their entry into the reaction chamber to insure that the gas and air are at least at the temperature of the ignition point, effecting a thermal reducing reaction of the exhaust gas in an inflow chamber in a first stage before combination of the exhaust gas with the air in the reaction chamber, and introducing said exhaust gas from the engine into said inflow chamber to produce rotation of the exhaust gas in said inflow chamber which draws the exhaust gas from the cylinders of the engine to effect dynamic scavenging thereof and serves as a flywheel with respect to evacuation of the exhaust gas from the engine, a predischarge period and period of overlapping of the inlet and outlet valves of the engine being adapted to the flywheel effect of the rotating exhaust gas.

4,164,848

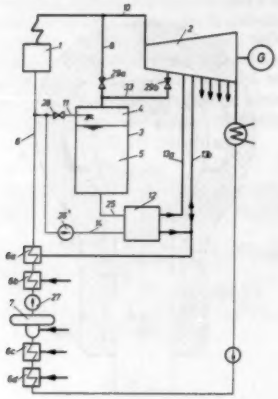
METHOD AND APPARATUS FOR PEAK-LOAD COVERAGE AND STOP-GAP RESERVE IN STEAM POWER PLANTS

Paul V. Gilli, Obere Teichstrasse 21/i, 8010 Graz, and Georg Beckmann, Vienna, both of Austria, assignors to Paul Viktor Gilli, Graz, Austria

Filed Dec. 21, 1976, Ser. No. 752,861
Int. Cl.[2] F01K *3/00*
U.S. Cl. 60—652 **29 Claims**

1. An arrangement for energy storage for peak load cover-

age and reserve in a steam power plant, comprising: live steam generator means; a steam turbine connected to said live steam generator means by a live steam line; a storage vessel with steam cushion volume and water content volume; a secondary steam generator with at least one stage; means for connecting said water content volume of said storage vessel to said secondary steam generator; a working steam line connecting said secondary steam generator on the steam side to said steam



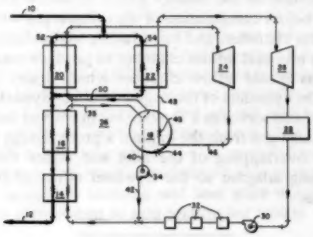
turbine; a feed water line; a cold water reservoir; a hot-water return line connecting said secondary steam generator on the water side to said feed water line and said cold water reservoir, said cold water reservoir being connected to said feed water line; a superheater; an auxiliary steam line connecting said steam cushion volume of said storage vessel to a point of the main steam cycle of the plant upstream of the entry point of said working steam line and to said live steam line following said superheater.

4,164,849

METHOD AND APPARATUS FOR THERMAL POWER GENERATION

James D. Mangus, Hempfield Township, Westmoreland County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 30, 1976, Ser. No. 728,478
Int. Cl.[2] F01K 7/22
U.S. Cl. 60—679 **11 Claims**



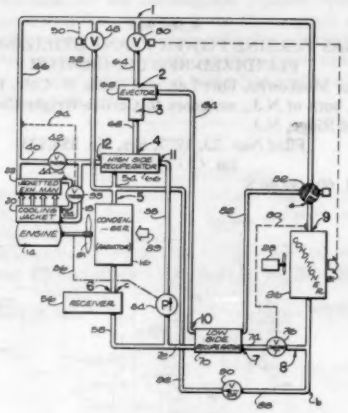
1. Apparatus for thermal power generation comprising:
a. a circulating vaporizable utilization fluid,
b. an evaporator wherein said fluid is vaporized,
c. a drum wherein liquid is separated from said vaporized fluid so as to form a liquified portion and a saturated vapor portion,
d. a superheater wherein said vapor portion is superheated,
e. a first expansion means wherein said superheated fluid is expanded,
f. heat exchange means wherein said expanded fluid is in heat exchange relation with fluid from one of said evaporator, said drum, and said superheater, and is preheated, subsequent to said expansion,
g. a reheater wherein said preheated fluid is resuperheated,
h. at least one second expansion means wherein said resuperheated fluid is expanded,
i. a condenser wherein said last-named fluid is condensed, and
j. means to combine liquid from said liquified portion and said condensed fluid prior to entry into said evaporator.

4,164,850

COMBINED ENGINE COOLING SYSTEM AND WASTE-HEAT DRIVEN AUTOMOTIVE AIR CONDITIONING SYSTEM

Alvin Lowi, Jr., 2146 Toscanini Dr., San Pedro, Calif. 90732

Filed Nov. 12, 1975, Ser. No. 631,023
Int. Cl.[2] F25B 27/02, 14/04
U.S. Cl. 62—196 C **14 Claims**



1. An automotive engine cooling and air conditioning cooling and heating system for utilizing otherwise wasted heat from an engine to vaporize refrigerant fluid, comprising:
a closed fluid circuit means;
an automotive engine including a cooling jacket therefor;
refrigerant engine cooling fluid in said circuit means;
condenser means for condensing vaporized refrigerant fluid;
means for delivering condensed refrigerant fluid from said condenser means to and through said engine cooling jacket whereby to cool said engine and vaporize said fluid;
means including an aspirator for conveying vaporized refrigerant fluid from said engine to said condenser;
conditioner means, comprising means for passing air in heat exchange relation with said refrigerant fluid to effect heating and cooling; and
means for diverting at least a portion of said refrigerant fluid from said cooling jacket directly to said condenser means in response to a predetermined pressure level in said circuit means whereby to maintain the temperature of said cooling jacket below a predetermined temperature.

4,164,851

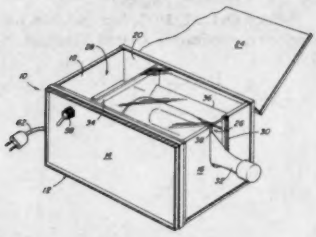
BEVERAGE CONTAINER COOLER

Jon A. Bryant, P.O. Box 3, Forestdale, Vt. 05745

Filed Dec. 19, 1977, Ser. No. 846,484
Int. Cl.[2] F25D 25/02
U.S. Cl. 62—381 **3 Claims**

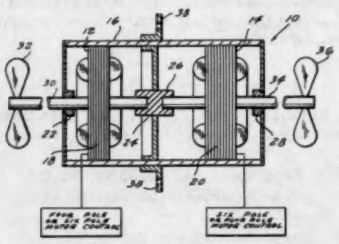
1. A beverage container cooler for rapid chilling of beverages within containers comprising:

a housing having four side walls, a base and a top hinged along one side wall;
a cooling compartment within said housing having four transparent side walls, a base and a removable cover, said cooling compartment being watertight;
a mechanical compartment within said housing adjacent to said cooling compartment;
a pair of cylindrical rollers mounted near the base of the side walls of said cooling compartment such that the longitudinal axis of each of said roller is in the horizontal plane and such that each of said rollers can rotate freely within the cooling compartment;
said rollers being spaced apart sufficiently to support a cylindrical container placed between them;
said rollers having longitudinal drive shafts extending through a side wall separating said cooling compartment from said mechanical compartment;



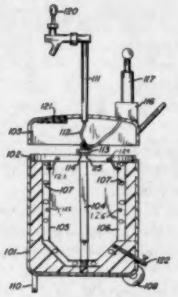
an angularly disposed ice retaining strip mounted on the rear wall of said cooling compartment sloping downwardly and inwardly to retain a cooling substance in frictional contact with a cylindrical beverage container horizontally positioned on said rollers;
an electrical motor mounted in said mechanical compartment;
a drive shaft extending from said electrical motor;
a drive gear mounted on said drive shaft;
one gear mounted on the drive shaft of each of said roller shafts in said mechanical compartment;
said gear on said motor shaft engaging said gears on said roller shafts;
means for connecting said motor to a source of electrical energy;
an on-off switch to control said motor.

4,164,852
FAN MOTOR UNIT FOR ROOM AIR CONDITIONER
Carmen J. Anzalone, Old Bridge, N.J., assignor to Fedders Corporation, Edison, N.J.
Filed Jan. 26, 1978, Ser. No. 872,365
Int. Cl.[2] F25D *17/06*
U.S. Cl. 62—429 **13 Claims**



1. In an improved air conditioning unit of the type having a compressor circuit including a condenser coil, an evaporator coil and a compressor and wherein air, from which heat is to be removed, is forced over the evaporator coil by an evaporator coil fan driven by an evaporator coil fan motor, and air, which is to remove heat from the unit, is forced over the condenser coil by a condenser coil fan driven by a condenser coil fan motor, the improvement comprising:
a unitary motor housing adapted for mounting in said unit, said evaporator coil fan motor and said condenser coil fan motor being individually formed in said unitary motor housing whereby both said motors will be simultaneously mounted when the housing is mounted; and
control means operable to maintain operation of the air conditioning unit under high ambient temperature conditions by reducing the load on the compressor circuit, said control means comprising separate motor controls for said evaporator coil fan motor and said condenser coil fan motor and being responsive to high ambient temperature conditions to reduce the speed of the evaporator coil fan motor independently of the control of the speed of the condenser coil fan motor.

4,164,853
COOLER
John McDonough, 1820 Dagmar Ave., Pittsburgh, Pa. 15216
Filed Mar. 30, 1977, Ser. No. 782,933
Int. Cl.[2] F25D *3/08*
U.S. Cl. 62—457 **5 Claims**



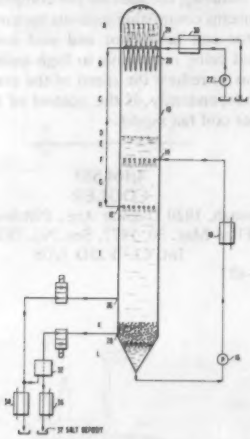
1. A cooler for barrels of beer comprising:
a container to support, and having sufficient volume to envelope, a barrel of beer and adapted to contain a cooling media, said container having separable top and bottom sections which are removably sealable to isolate the barrel of beer from the atmosphere;
means for thermally insulating the interior of said container from the outside atmosphere;
means for manually pressurizing the barrel of beer external to said container including an air holding chamber in communication with said barrel of beer;
pressure regulation means associated with said air holding tank which maintains the pressure within said barrel at a predetermined level;
means for withdrawing the beer external to said container, while said top and bottom sections are sealed; and
said cooler being self-contained and portable.

4,164,854
DESALINATION METHOD WITH MERCURY REFRIGERANT
John K. Martin, Monterrey, Mexico, assignor to Fabrication de Maquinas, S.A., Monterrey, Mexico
Filed Nov. 23, 1977, Ser. No. 854,473
Int. Cl.[2] B01D *9/04*
U.S. Cl. 62—536 **3 Claims**

1. A freezing process for obtaining pure water from salt water comprising:

feeding salt water to a vertically arranged elongated closed tank to establish a column of salt water therein, the level of which is above the feed point;

continuously cooling a body of mercury externally of said tank, and injecting said mercury in the form of finely atomized particles into the upper portion of said liquid column, withdrawing said mercury from the bottom of said tank and recirculating said mercury through said liquid column to maintain the column at a temperature which is subcooled with respect to the salt water infeed so that the infeed has ice crystals formed therein due to contact with the subcooled column;



permitting the ice crystals to accumulate and form a solid block of ice in the upper portion of said tank above the level of mercury injection;

moving said block of ice upwardly in said tank by hydraulic pressure of incoming salt water and melting the upper portion of said block of ice by indirect heat exchange with the salt water feed prior to entry of said feed into said column and withdrawing pure water from the upper portion of the tank between the top of said tank and the top of said ice block; and

withdrawing concentrated salt water and precipitated salts collected above the mercury from the lower portion of said tank.

4,164,855

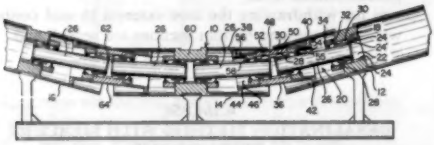
SEGMENTED DRIVING SHAFT

Michael M. Calistrat, Sykesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1978, Ser. No. 932,343

Int. Cl.[2] F16C *1/02*

U.S. Cl. 64—2 P **2 Claims**



1. An improved segmented driving shaft, said shaft driven by a powered prime mover, comprising:

(a) a plurality of operably connected driven roll members, said rolls having an inner axial bore, the first of said driven roll members being operably connected to said prime mover.

(b) a plurality of alignment tube members inserted in and in contact with adjacent ends of said rolls to form a continuous segmented shaft, said tube members having an inner axial bore.

(c) internal gear teeth means formed within said axial bores of said roll members and said tube members.

(d) a plurality of shaft means extending within said axial bores of said roll and tube members having external gear teeth thereon, said external gear teeth of said shafts adapted to mesh and coact with said internal gear teeth, of said roll and tube members said shafts means adapted to transmit torque from one of said roll members to the adjacent roll members.

4,164,856

YARN END COLLECTION

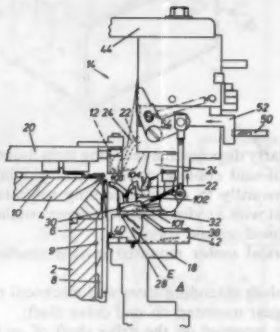
Arthur R. Smith, Leicester, England, assignor to Wildt Mellor Bromley Ltd., Leicester, England

Filed Oct. 31, 1977, Ser. No. 846,905

Claims priority, application United Kingdom, Nov. 10, 1976, 46767/76

Int. Cl.[2] D04B *15/60*

U.S. Cl. 66—140 R **9 Claims**



7. A striper for use in circular knitting machines of the type having a cylinder carrying needles and having an aperture for directing air outwardly from the cylinder, said striper comprising a front and a rear, the front capable of being mounted in proximity to the cylinder of the circular knitting machine, a plurality of yarn feeding fingers moveable into and out of a feeding attitude, a trapping mechanism for entrapment of ends of yarn not being fed, a cutting mechanism for severing yarn previously fed to enable the yarn to be trapped and for severing yarn newly fed to the needles of the cylinder to free the yarn from entrapment, said striper having a guide passage extending substantially from the front to the rear of the striper, said passage having side and bottom surfaces and open at the top to receive yarn ends dropping from the cutting and trapping mechanisms, said passage open at the front and rear of the striper to permit the removal of yarns from the guide passage by the flow of air from the aperture.

4,164,857

PLUGLESS PIN TUMBLER CYLINDER

Joseph M. Genakis, 948 W. Boylston St., Worcester, Mass. 01606

Filed Apr. 7, 1977, Ser. No. 785,655

Int. Cl.[2] E05B *19/00, 21/00, 35/04*

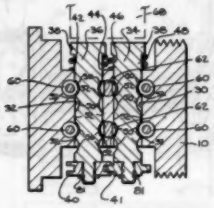
U.S. Cl. 70—352 **7 Claims**

1. A plugless cylinder lock comprising:

a lock housing means defining a plurality of parallel pinways and a keyway communicating therewith;

a locking selector rectilinearly movable in said housing between open and closed positions in a direction transverse to said pinways;

a pin disposed in each of said pinways and each movable from locking positions to a selective release position by engagement with a properly bitted key in said keyway, said housing means preventing movement of said pins in the direction of movement of said selector, and said pins and said selector being shaped and arranged to engage and prevent said movement of said selector with said pins in



said locking positions and to disengage so as to permit said movement of said selector with said pins in said release positions, said pins and said selector being further shaped and arranged to engage in response to movement of said selector out of said open position and thereby prevent said movement of said pins; and

means for moving said selector into said open position upon insertion of a proper key in said keyway.

4,164,858

ROLLING MILL WITH ROLL BENDING UNIT

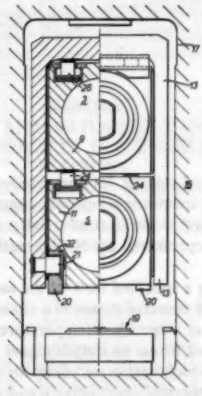
Gordon D. Holmes, Worksop, England, assignor to Davy-Loewy Limited, Yorkshire, England

Filed Jun. 23, 1978, Ser. No. 918,543

Claims priority, application United Kingdom, Jun. 24, 1977, 26633/77

Int. Cl.[2] B21B *29/00*

U.S. Cl. 72—237 **6 Claims**



1. An assembly for use in a rolling mill, said assembly comprising first and second rolls each having a roll barrel, a roll neck at each end having a first bearing chock inboard of said each end and a further bearing chock on an extended portion of each neck positioned outwardly of the first bearing chock, the rolls being arranged one above the other with their longitudinal axes parallel, each of the two further chocks on the first roll having a reaction member positioned on the side of the corresponding further chock of the second roll which is remote from the first roll, fluid operable means positioned between the corresponding further chocks of the two rolls and arranged so that on being actuated the separation of the further chocks is increased and fluid operable means positioned between the reaction member and the further chocks of the second roll and arranged so that on being actuated the separation of the further chocks is reduced.

4,164,859

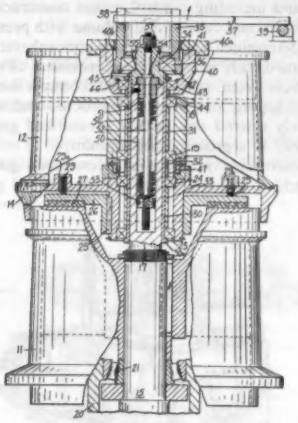
WIRE ACCUMULATOR

Wilhelm A. Steinhilber, Guilford, Conn., assignor to Orion Machinery and Engineering Corporation, Branford, Conn.

Filed Dec. 5, 1977, Ser. No. 857,572

Int. Cl.[2] B21C *1/14*

U.S. Cl. 72—289 **8 Claims**



1. In a double block accumulator of the type comprising a driven lower block for drawing wire and an upper coaxial block rotatable relative to the lower block where the wire is first wound on the lower block and then wound on the upper block in the reverse direction, pressure responsive frictional coupling means disposed between said blocks, and means for varying the coupling pressure on said coupling means; said means for varying the pressure being effective to vary the pressure at a predetermined rate with movement thereof, and means for limiting the coupling pressure that can be applied to said coupling means by said varying means to a predetermined value while still permitting relative rotation between said upper and lower blocks.

4,164,860

INTERNAL GASEOUS FLUID STRIPPER FOR CAN BODYMAKERS AND THE LIKE

Rimvydas A. Kaminskas, Palos Verdes Estates, Calif., assignor to Standun, Inc., Compton, Calif.

Filed Jun. 3, 1976, Ser. No. 692,505

Int. Cl.[2] B21D *45/00*

U.S. Cl. 72—345 **26 Claims**

1. In an internal stripper for apparatus having a reciprocal ram for carrying an article positioned over a forward end portion and end surface of said ram through die means for shaping said article to form a cup-shaped article which in final form on said ram has a predetermined volume including a predetermined side wall axial length closely abuttingly conforming to said ram forward end portion and which is then stripped from said ram, and wherein said apparatus includes means for reciprocating said ram such that said forward end portion thereof is carried between a position spaced from the inlet end of said die means and a position spaced a predetermined distance from the outlet end of said die means at least equal to said predetermined side wall axial length of said cup-shaped article; the combination of:

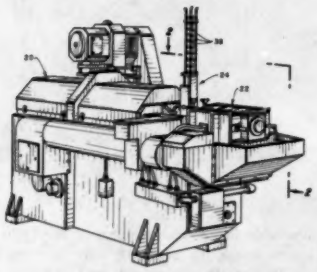
a cavity in said ram having a permanent preset total volume, said cavity being constructed and arranged free of reduction of said preset volume and free of appreciable pressur-

ized gas flow restriction forwardly of said ram within said cavity at least prior to and through stripping of said article from said ram;

opening means between said cavity and said ram end surface sized sufficiently to at all times permit a relatively free unobstructed flow of pressurized gas from said cavity through said ram end surface and internally against said article to subject said article internally to said cavity permanent preset total volume throughout said article stripping; and

a pressurized gas supply means operably connected to said cavity and including control means constructed and arranged to fill said cavity total volume with pressurized gas at a predetermined pressure above atmospheric pressure at least immediately prior to commencement of stripping of said article from said ram, said control means during article stripping also being constructed and arranged to effectively restrict any further pressurized gas flow into said cavity to a preset added amount;

said predetermined pressure of pressurized gas and said preset added amount of further pressurized gas flow in



said cavity as regulated by said control means being such that, during progressive stripping of said finally formed cup-shaped article of predetermined volume and side wall axial length from said ram progressively adding increasing parts of said article volume to said cavity volume for mutual containment of said gas while resultantly constantly progressively reducing pressure of said gas so contained, the progressively reducing gas pressure mutually contained in said cavity and article volumes during stripping of said cup-shaped article from said ram will be maintained above atmospheric pressure and against escape by said cup-shaped article predetermined side wall axial length throughout said article stripping and until said cup-shaped article is actually separating from said ram forward end portion, the regulation by said control means of said predetermined pressure of pressurized gas and preset added amount of further pressurized gas flow in said cavity being such that the progressively reduced gas pressure in said cavity volume and article volume is not less than atmospheric pressure at the time of complete stripping of said cup-shaped article from said ram.

4,164,861

LEAK STANDARD GENERATOR

Fritz H. Schlereth, Baldwinsville, and Michael J. Morgan, Syracuse, both of N.Y., assignors to Inficon Leybold-Heraeus Inc., East Syracuse, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,768
Int. Cl.[2] B01B *17/00*
U.S. Cl. 73—1 G **16 Claims**

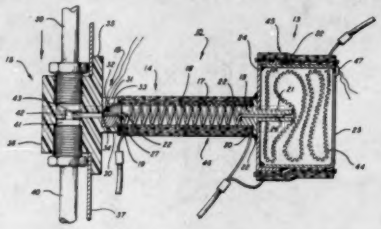
1. A leak standard generator including

a discharge head for passing a metered flow of diluent gas therethrough,

a sealed reservoir containing a leak sample,

a diffusion tube extending between the reservoir and the discharge head, said tube being of a predetermined length and a uniform cross sectional area such that the diluent gas being metered through the discharge head is allowed to pass freely into the tube to at least partially fill said tube, and

heater means operatively associated with the reservoir for



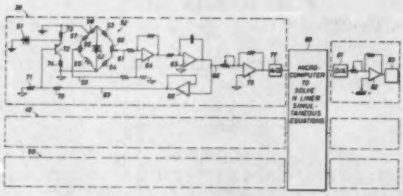
maintaining the reservoir at a desired temperature level to at least partially vaporize said leak sample whereby the vapor of the sample generated in the reservoir diffuses through the diluent gas contained in said tube at a controlled rate and is discharged into the flow of diluent gas passing through said discharge head.

4,164,862

MULTICOMPONENT THERMAL CONDUCTIVITY ANALYZER

Milton L. Jackson, Drawer 90,000 G, Houston, Tex. 77090

Filed Nov. 25, 1977, Ser. No. 854,817
Int. Cl.[2] G01N *25/18*
U.S. Cl. 73—27 R **13 Claims**



1. A method of solving for the relative concentrations of constituents in a specimen where the constituents have different coefficients of thermal conductivity and the number of constituents is represented by N, the method comprising the steps of:

(a) conducting a specified flow of the sample past a thermal conductivity detector means in a chamber which means is maintained at a specified temperature in a testing circuit which circuit forms an output signal V_N proportional to the rate at which heat in said detector means is varied with changes in thermal conductivity and which output signal is obtained during the flow of the specimen therepast;

(b) obtaining a set of N calibration output signals C_N from pure cnstituents of the specimen flowing past the detector means;

(c) operating a chamber and associated detector means at N different temperature levels to obtain therefrom $N \times N$ calibration output signals C_{NN} on flowing the specified flow of sample therepast;

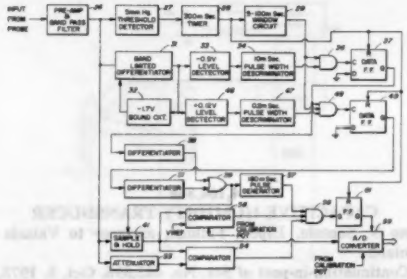
(d) solving N simultaneous equations to obtain the relative measures of N constituents in the specimen by using the output signals and calibration signals in the following relationship:

$$V_1 = C_{11} A + C_{12} B \ldots$$
$$V_N = C_{N1} A + C_{N2} B \ldots$$

4,164,863
SYSTEM AND METHOD FOR ANALYZING TONOSIGNALS

Charles W. Ragsdale, Garden Grove, Calif., assignor to Cavitron Corporation, New York, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,584
Int. Cl.[2] A61B *3/16*
U.S. Cl. 128—652 **24 Claims**



21. In a system for analyzing an electrical probe signal representative of force-displacement information from an applanating probe:

A. Means for monitoring said probe signal to determine whether the following conditions are satisfied:

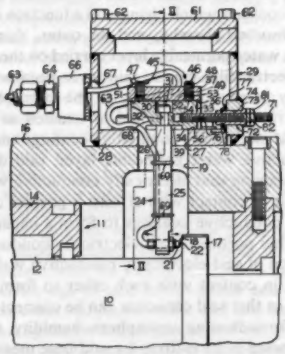
1. Said probe signal reaches a predetermined threshold level at least a predetermined minimum time after any previous reaching of said level,
2. The level of the probe signal changes at a positive rate which decreases within a predetermined time window which commences a predetermined time after said threshold level is reached,
3. The decreased rate of change continues for a predetermined period of time within said time window; and

B. Means active upon satisfaction of all of said conditions for providing an output signal corresponding to the level of said probe signal at the time said conditions are satisfied.

4,164,864
METHOD AND APPARATUS FOR SUPPORTING A SENSOR IN A NORMALLY INACCESSIBLE AREA OF A MACHINE

Thomas R. Feller, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jul. 31, 1978, Ser. No. 929,649
Int. Cl.[2] G01M *13/00*
U.S. Cl. 73—118 **8 Claims**



1. In a method of supporting a sensor within a normally inaccessible area of an operative machine to pick-up the axial float of a rotating shaft, the axial end face of which cannot be sensed, comprising the steps of:

suspending the sensor on the end of a support;

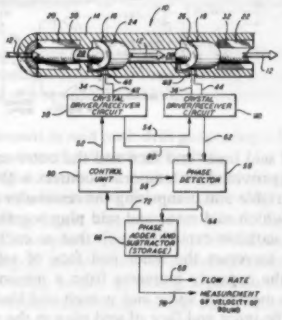
inserting the support into the normally inaccessible area of the machine without displacing portions of the machine in position to locate the sensor adjacent to a portion of the shaft other than the axial end face thereof adaptable to continuous axial position monitoring;

providing adjusting means external of the machine for adjusting the position of the sensor with respect to the shaft portion which it is monitoring.

4,164,865
ACOUSTICAL WAVE FLOWMETER

Lawrence G. Hall, and Robert S. Loveland, both of West Covina, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 770,677, Feb. 22, 1977, abandoned.
This application Jul. 24, 1978, Ser. No. 927,270
Int. Cl.[2] G01F *1/66*
U.S. Cl. 73—194 A **30 Claims**



1. A meter for measuring the flow of a fluid along a path comprising, in combination:

transducer means for transmitting acoustic compression waves upstream and downstream in a fluid flowing in said path;

means for measuring the phase difference between two spaced points in the fluid flow path of the acoustic compression waves transmitted upstream and means for measuring the phase difference between two spaced points in the fluid flow path of the acoustic compression waves transmitted downstream;

means for producing a difference signal dependent on the difference between the two phase differences, the magnitude and sign of which being directly related to the instantaneous fluid flow rate and its direction;

means for automatically adjusting the frequency of the acoustic compression waves to a frequency where a fixed wavelength distance, in the fluid flow medium, occurs across the path of the transducer means, thereby maintaining operation at the acoustic resonance to maximize the magnitude of the received signal.

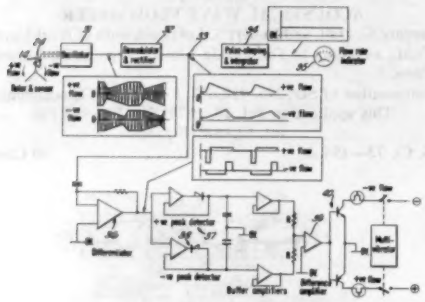
4,164,866
APPARATUS FOR MONITORING AMOUNT AND DIRECTIONS OF FLUID FLOW IN FLUID POWER SYSTEMS

Henry M. Mitchell, Alloway, Scotland; John Elias, Llanerchymedd, and John Moorcroft, Llanfairfechan, both of Wales, assignors to Mannin Industries Ltd., Castletown, Isle of Man

Filed Apr. 5, 1978, Ser. No. 893,269
Int. Cl.[2] G01F *1/10*
U.S. Cl. 73—231 R **3 Claims**

1. A standard fitting for permanently connecting together an

appliance and a pipe in a fluid power system, the standard fitting comprising a tubular body having coupling portions at opposite ends thereof, an annulus fitted within said tubular body and carrying a rotor having blades, said tubular body and said annulus each having an opening therethrough which openings are aligned transversely of the axis of rotation of the rotor, an electrically-insulating sealing sleeve received within the pair of said aligned openings, and an electrically conductive plug fitted within said sleeve and presenting inner and outer end faces, the inner end face of said plug being triangular with one side arranged substantially parallel with the end face of each said blade of said rotor when such blade is in the



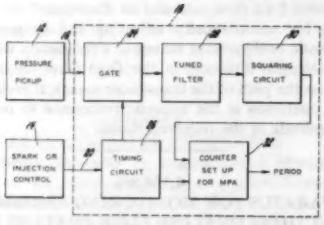
vicinity of said inner end face and the outer end face of said plug being provided for temporary contact with a probe terminal of a portable unit comprising the remainder of an electrical circuit in which said rotor and said plug together constitute a cyclically variable capacitor such that as each said blade of said rotor traverses the inner end face of said plug in one direction the capacity increases from a minimum value to a cut-off at a maximum value and as each said blade of said rotor traverses the inner end face of said plug in the opposite direction the capacity decreases from a cut-in at said maximum value to said minimum value, whereby the opposite direction of rotation of said rotor may be differentiated.

4,164,867

METHOD OF MEASUREMENT OF BULK TEMPERATURES OF GAS IN ENGINE CYLINDERS

Robert Hickling, Huntington Woods; James A. Hamburg, Southfield; Douglas A. Feldmaier, Birmingham, and Jing-yau Chung, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1978, Ser. No. 937,066
Int. Cl.[2] G01K *1/02*
U.S. Cl. 73—346 **3 Claims**



1. The method of measuring the bulk temperature of gas in the combustion chamber of an internal combustion piston engine during combustion comprising the steps of

operating an internal combustion piston engine to produce knock,

sensing the high frequency pressure oscillation occurring in the combustion chamber during a knock event to provide an electrical signal representing such oscillation,

detecting in the electrical signal frequencies representing the lowest mode resonance of the pressure oscillation, and

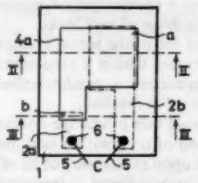
measuring the frequencies of the lowest mode resonance signal whereby each such frequency constitutes a measure of the bulk temperature of the gas in the combustion chamber at a given time.

4,164,868

CAPACITIVE HUMIDITY TRANSDUCER

Tuomo S. Suntola, Espoo, Finland, assignor to Vaisala Oy, Finland

Continuation-in-part of Ser. No. 403,896, Oct. 5, 1973, abandoned. This application Jul. 22, 1975, Ser. No. 598,034
Claims priority, application Finland, Oct. 12, 1972, 2831/72
The portion of the term of this patent subsequent to Jun. 10, 1994, has been disclaimed.
Int. Cl.[2] G01N *25/64*; H01G *7/00*
U.S. Cl. 73—336.5 **14 Claims**

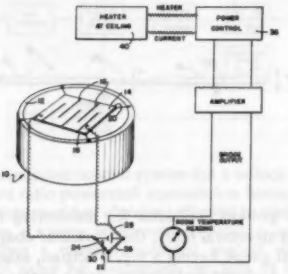


1. In a capacitive humidity transducer, electrically non-conductive base means having an outer supporting surface, at least a pair of electrically conductive coatings carried by said base means at said outer supporting surface thereof, said electrically conductive coatings being spaced from each other and being passive with respect to water absorption, dielectric film means also carried by said surface of said base means, said dielectric film means covering at least a portion of said electrically conductive coatings and being composed at least in part of a film which is active with respect to water absorption and which has a dielectric constant which changes as a function of the amount of water absorbed thereby, and an outer, thin, electrically conductive, water-permeable layer carried on the outer surface of said dielectric film means, said layer because of its water permeability permitting moisture in the atmosphere to reach said dielectric film means which is situated at least in part between said electrically conductive coatings and said electrically conductive water permeable layer, said dielectric film means maintaining said electrically conductive water permeable layer out of contact with at least a portion of one of said electrically conductive coatings to form a capacitor therebetween, another portion of said electrically conductive coatings and a portion of said electrically conductive water permeable layer being in contact with each other to form an electrical connection so that said capacitor can be connected to measuring means for indicating atmospheric humidity, said capacitor being supported in its entirety by said base means which provides a stable support for said capacitor enabling said dielectric film means to provide a rapid response to changes in humidity under a wide variety of atmospheric conditions.

4,164,869
THERMOSTAT SYSTEM FOR RADIANT ROOM HEATING

Theodor H. Benzinger, 6607 Broxburn Dr., Bethesda, Md. 20014

Continuation-in-part of Ser. No. 808,936, Jun. 22, 1977, abandoned. This application Sep. 12, 1977, Ser. No. 832,759
Int. Cl.[2] G01J *5/20, 5/24*
U.S. Cl. 73—355 R **12 Claims**

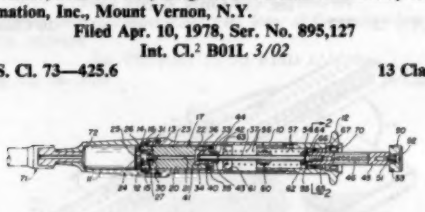


1. A thermostat system for radiant room heater system comprising a receiver of thermal radiation constructed and arranged having means sensitive to air temperature and to air convection, said receiver consisting of a thin film deposit of material of a high temperature coefficient of electrical resistance and forming one arm of a Wheatstone bridge, the other arms of which being substantially insensitive to temperature, said materials being supported on a film of electrically insulating material, said deposit having a plane surface area of precisely defined size and absorptive for infrared radiation and facing a two-Pi hemispherical environment.

4,164,870
PIPETTES

Emil A. Scordato, Bronxville, and Hugh W. Pratt, Pelham Manor, both of N.Y., assignors to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.

Filed Apr. 10, 1978, Ser. No. 895,127
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.6 **13 Claims**



1. A pipette comprising: barrel means having a nozzle end; piston means reciprocably movable in said barrel means, the periphery of said piston means being spaced from the internal wall of said barrel means to provide an air space around said piston means, said piston means being provided with an internal air passageway leading from said peripheral air space to the end of said piston means facing the nozzle end of said barrel means; valve means for closing said air passageway; first sealing means mounted on the end of said piston means remote from the nozzle end of said barrel means to provide an air-tight seal between said piston means and the internal wall of said barrel means, said first sealing means defining one end of an air chamber that includes the peripheral air space around said piston means; second sealing means mounted in said barrel means to cooperate with the end of said piston means proximate to the nozzle end of said barrel means and provide an air-tight seal between said piston means and said barrel means, said second sealing means defining a second end of the aforesaid air chamber; means connected to said piston means for reciprocating said piston means and said first sealing means within said barrel means between a first and a second limiting position; and an air air vent through the wall of said barrel means from said air chamber to the exterior of said barrel means, said air vent being located between said first and said second sealing means when said piston means is in its first limiting position, and being further located so that when said piston means is moved from its first to its second limiting position said first sealing means traverses the air vent to seal the aforesaid air chamber and thereafter compress the air therein.

4,164,871
PUSH DRILL GUIDANCE INDICATION APPARATUS

Charles F. Cole, and Jimmie H. Elenburg, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 30, 1978, Ser. No. 891,679
Int. Cl.[2] E21B *7/08*
U.S. Cl. 73—432 R **6 Claims**

1. A remote guidance indication system for push drills of the type that are continuously controllable as to pitch and roll of the longitudinal axis in order to determine directivity, comprising:

first sensing means in said push drill generating a first output signal indicative of the push drill pitch;

second sensing means in said push drill generating a second output signal indicative of the push drill roll;

radiation sensing means responsive to natural radioactivity emanating from space adjacent said push drill and generating a rate signal proportional to radiation count rate, said radiation sensing means including a gamma ray counter means providing count pulse output and means for amplifying and integrating said pulse output to provide a signal having an amplitude indicative of gamma ray count per unit time; and

remotc operating means connected to receive said first and second output signals and said rate signal to provide indication enabling remote guidance control of said push drill.

4,164,872
METHOD FOR DETERMINING SPINNING OR SLIPPING OF THE WHEELS IN PROPULSION VEHICLES WITHOUT DEAD AXLES

Karlheinz Weigl, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,556
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707047
Int. Cl.[2] G01P *3/50;* **B61C** *15/08*
U.S. Cl. 73—510 **8 Claims**

1. A method for determining spinning and slipping of the wheels in propulsion vehicles without dead axles, particularly rail propulsion vehicles, comprising:

(a) measuring the wheel velocities of all axles;

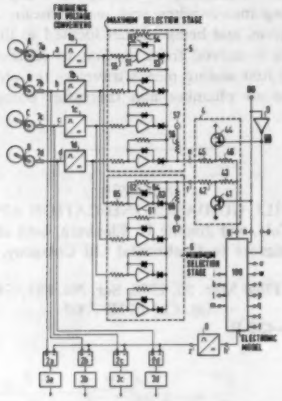
(b) determining the highest and the lowest wheel velocity of the measured wheel velocities of all axles;

(c) in the presence of a braking command selecting the highest wheel velocity and otherwise selecting the lowest wheel velocity for further use;

(d) determining a simulated vehicle velocity from the selected wheel velocity, taking into consideration influence variables which cause acceleration or deceleration of the vehicle;

(e) comparing the simulated vehicle velocity with the mea-

sured wheel velocities to determine the differences therebetween; and



(f) converting the differences that occur into signals for influencing the drive or the braking device of the respective axle.

4,164,873

METHOD OF AND DEVICE FOR MATERIAL CHECKING BY ULTRA SOUND WHILE EMPLOYING AN ELECTRODYNAMIC SOUND CONVERTER

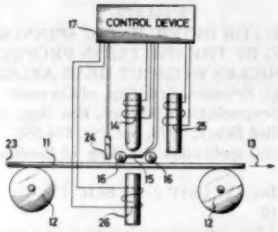
Wolfgang Böttcher, and Hermann-Josef Kopineck, both of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Sep. 27, 1977, Ser. No. 836,964

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1976, 2643601

Int. Cl.² G01N *29/04*

U.S. Cl. 73—643 **7 Claims**



1. A method of ultrasonically checking a moving workpiece utilizing an electrodynamic sound converter which includes an electromagnetic coil means for creating a magnetic field when energized and a high frequency coil for testing the workpiece magnetized by said electromagnetic coil means when energized by a current of varying amplitude, said method comprising: initiating operation of a control device when the amplitude of the current to said electromagnetic coil means reaches a given value to turn on energization of said high frequency coil for testing said workpiece and terminating operation of said high frequency coil when said amplitude falls below a given value.

4,164,874

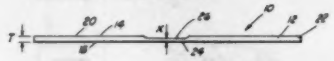
FLAW GROWTH CORRELATOR

Gary G. Cassatt, and Richard J. Miller, both of Wichita, Kans., assignors to Boeing Wichita Company, Wichita, Kans.

Filed Jan. 19, 1978, Ser. No. 870,616

Int. Cl.² G01N *3/32*

U.S. Cl. 73—799 **15 Claims**



1. A flaw growth correlator for monitoring flaw growth potential in a structural body, the correlator comprising:

a flat metal gauge having a top, a bottom, sides, a first end portion, a second end portion, and a center portion, said gauge having a length (L), a width (W), and a thickness (T), the center portion including a necked down area across the width (W) of said gauge and having a thickness (X) less than (T); and

a crack initiating stress raiser disposed in the necked down area of the center portion of said gauge; an aperture in the necked down area of the center portion of said gauge, said crack-initiating stress raiser extending outwardly from the side of said aperture.

4,164,875

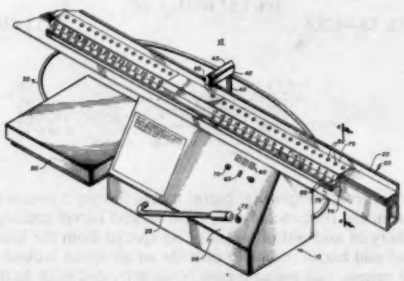
APPARATUS FOR MATCHING SKIS

Anthony M. Kantar, 6495 Barrie Rd., Minneapolis, Minn. 55435, and George E. Pribyl, 5106 W. 105th St., Minneapolis, Minn. 55437

Filed Mar. 17, 1978, Ser. No. 887,484

Int. Cl.² G01N *3/20*

U.S. Cl. 73—812 **16 Claims**

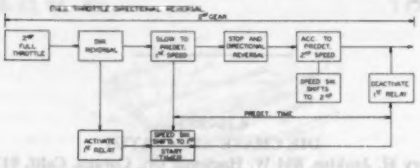


1. An apparatus for matching skis to the user and one of the pair of skis to the other, comprising: an elongated beam structure positioned on a frame and adapted to have a ski positioned thereon, pressure applying member movably mounted at a fixed location on the frame and movable toward and away from the beam structure to contact a ski thereon and flex the ski transversely while the ski is held against longitudinal movement relative to said frame, means including a pivoted lever mounted on the frame and connected to the pressure applying means to move the same, transducer means associated with said last named means to measure the force on the pressure applying member in flexing the ski at various positions along its length and means located along the length of the beam structure to indicate the extent of transverse flexure thereat while the ski is so held and flexed by said pressure applying member.

4,164,876
DOWNSHIFT INHIBITOR CIRCUIT

Jon H. Peppel, Horton, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 9, 1977, Ser. No. 794,763
Int. Cl.² B60K *41/18*; F16H *3/08, 5/42, 5/68*
U.S. Cl. 74—336 R **10 Claims**

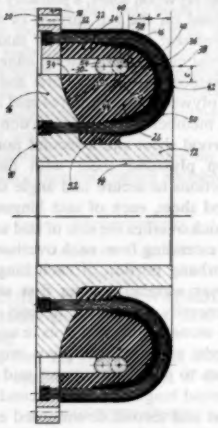


1. In a transmission control system for a vehicle including a multiple speed ratio powershift transmission having a plurality of fluid pressure operated clutches, adapted to establish torque ratio changes; a source of pressurized fluid; a speed control cover including a manually-actuated control means and a speed control valve for controlling the flow of fluid to said clutches; an electronic speed sensing system; and downshift valve means, for automatically shifting said transmission from a higher speed ratio to a lower speed ratio at a first predetermined ground speed by diverting the fluid for pressurizing a higher speed ratio clutch to a lower speed ratio clutch and automatically shifting said transmission from said lower speed ratio back to said high speed ratio at a second predetermined ground speed by ceasing the diverting of said fluid, wherein the improvement comprises means for prohibiting automatic downshifts from said higher speed ratio to said lower speed ratio while said vehicle undergoes a rapid directional reversal.

4,164,877
COUPLING FOR THE VIBRATION-DAMPING TRANSMISSION OF TORQUES

Ilie Chivari, Berliner Strasse 1, 4690 Herne 2, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 803,464
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626414
Int. Cl.² F16F *15/10*; F16D *3/14*
U.S. Cl. 74—574 **24 Claims**



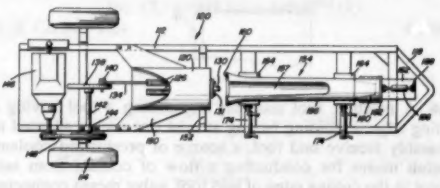
1. Coupling for the vibration-damping transmission of torques, comprising: an inner coupling member, which is provided with a substantially radial flange, and an annular outer coupling member, which surrounds the inner coupling member substantially concentrically, an annular toroidal compression cushion of elastomeric material, which is U-shaped in longitudinal section and which is connected to the outer coupling member along its outer edge and with the flange of the inner coupling member along its inner edge, an annular chamber being defined inside the compression cushion, and a plurality of non-extensible ropes, which are each connected to the outer and to the inner coupling member, in uniform distribution along the periphery of the coupling members, and are arranged substantially in longitudinal planes forming rope loops around the annular toroidal compression cushion, the compression cushion being loaded and resiliently deformed by compression through the ropes under the action of a torque to be transmitted, when the coupling members are rotated relative to each other from a position of rest, characterized in

that the compression cushion is a permanent shape rubber element having said annular, cylindrical chamber open towards one side in axial direction, said chamber being in communication with the atmosphere.

4,164,878
WELL DRILLING BIT DRESSING APPARATUS AND METHOD

John Herke, Rte. 5, Box 375, Yakima, Wash. 98902

Continuation-in-part of Ser. No. 635,844, Nov. 28, 1975, abandoned. This application Dec. 29, 1977, Ser. No. 865,504
Int. Cl.² B21K *5/02*
U.S. Cl. 76—5 R **9 Claims**



1. In a well drilling bit dressing apparatus comprising a frame, means supporting a well drilling bit longitudinally on the frame, a single reciprocal hammer mounted on the frame in opposed relation to the bit, said hammer having a die on the end thereof adjacent the bit for impact engagement with the face of the bit, means supporting and guiding the hammer from the frame, and means reciprocating the hammer for impact engagement of the die with the face of the bit, that improvement comprising said die and bit being disposed in the same horizontal plane with the die having a horizontal dimension substantially less than one half the horizontal width of the face of the bit and a vertical dimension generally equal to the vertical width of the face of the bit for impact engagement with only a small surface area of the face of the bit during each impact of the die with the bit face.

4,164,879
MACHINE TOOL COOLANT SYSTEM

Kenneth R. Martin, Cincinnati, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Dec. 14, 1977, Ser. No. 860,594
Int. Cl.² B23B *3/20, 29/32, 25/00*
U.S. Cl. 82—2 R **22 Claims**

9. A machine tool assembly for receiving a variety of tools, some of which require coolant, comprising:

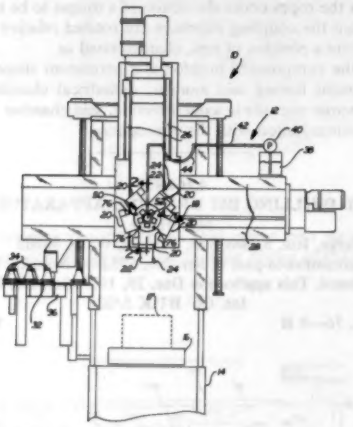
a base;

a rotatable turret supported from said base and having a plurality of recesses each of which is adapted to receive a portion of one of the tools;

said turret being rotatable to selectively index each tool receiving recess to a working position;

a cooiant fluid inlet formed on said turret;

a source of pressurized coolant fluid connected to said inlet;
coolant distributing means formed in said turret for providing a passage from said coolant inlet through said turret to the tool receiving recess in the working position;
valve means, operable to an open position and a closed position and which is biased to the closed position, formed in the passage provided by the coolant distributing means for controlling coolant flow therethrough; and
actuator means connected with the tools which require coolant for opening said valve means when one of the variety of tools which requires coolant is received in the recess of said turret.



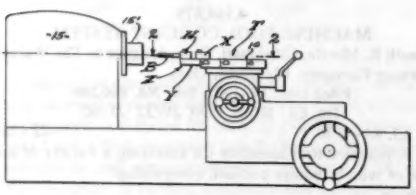
16. A machine tool assembly comprising a tool having a cutting edge, a housing having at least one socket adapted to releasably receive said tool, a source of pressurized coolant, conduit means for conducting a flow of coolant from said source to the cutting edge of said tool, valve means connected with said housing for controlling coolant flow through said conduit means, said valve means being operable between a closed condition blocking coolant flow in the absence of a tool in the socket and an open condition enabling coolant to flow through said conduit means when a tool is disposed in said socket, and actuator means connected with said tool for operating said valve means from the closed condition to the open condition.

4,164,880

TOOL HOLDER CARTRIDGE FOR CHUCKING LATHES

Joel E. Di Marco, 4288 Revere Pl., Culver City, Calif. 90230

Filed Nov. 18, 1977, Ser. No. 852,805
Int. Cl.[2] B23B *29/00*
U.S. Cl. 82—36 R **18 Claims**



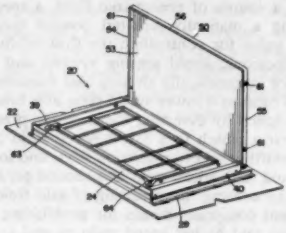
1. A production lathe adapter and setup arm for preserving setups to be reused on multi station turrets that sequentially index cutting tools into cutting position with respect to work turned by the lathe, the turret having a top face offset from and parallel with a turning axis, and including; at least one adapter having a bottom face fixedly secured to the turret and cantilevered therefrom at one station thereof, a setup arm having a top face releasably engaged with the cantilevered bottom face of the adapter, and coupling means securing the setup arm to the adapter, the top face of the setup arm projecting radially from the turret coplanar with the top face thereof for receiving holder means to set up a cutting tool engageable with the work.

4,164,881

DIE CHASE APPARATUS

Henry H. Jenkins, 864 W. Hacienda Dr., Corona, Calif. 91720

Filed May 8, 1978, Ser. No. 903,578
Int. Cl.[2] B26F *1/38*
U.S. Cl. 83—128 **6 Claims**



1. A die chase apparatus including in combination a generally rectangularly shaped metal base plate, a generally rectangularly shaped bottom plywood sheet flatly residing on said base plate and having first and second end portions, first and second die locators secured to said base plate and respectively abutting said first and second end portions of said bottom plywood sheet to locate the sheet on said plate, a generally rectangularly shaped top plywood sheet flatly residing on said bottom plywood sheet, a steel rule die having a base portion supported between said plywood sheets and having a portion extending through an opening in said top plywood sheet and terminating in a cutting edge located slightly above the top surface of said top plywood sheet, a plurality of rubber ejection members positioned on the top surface of said top plywood sheet and adjacent said cutting edge of said steel rule die to eject sheet material cut by said cutting edge, first and second hinges secured respectively to said first and second end portions of said top plywood sheet, each of said hinges comprising an angle shaped member with a first portion engaging the top of said top plywood sheet and a second portion engaging an end of said top plywood sheet with fasteners extending through said portions to secure said angle shaped member to said top plywood sheet, each of said hinges having an overhang portion which overlies the side of said top plywood sheet, a pivot member extending from each overhang portion of each hinge, each overhang portion of each hinge also having an abutment, a cover member having first and second downturned ends generally positioned at said first and second hinges, first and second elongated slots in said first and second downturned ends respectively, pivot members extending through said slots to pivotally connect said cover member to said first and second hinges, first and second side set screws in each of said first and second downturned ends of said cover member to engage said hinges and keep said cover aligned upon closing, first and second engaging portions on said cover member for engaging said abutments on said hinges in the open position of said cover, and a replaceable striker plate secured to the inside surface of said cover member.

4,164,882

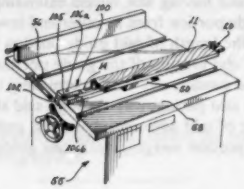
SPACER FOR WORKPIECE SUPPORTING APPARATUS USED WITH POWER TOOLS HAVING HIGH SPEED CUTTING MEMBERS

John E. Mericle, 2202 Torrey Pines, Tucson, Ariz. 85710

Continuation-in-part of Ser. No. 842,500, Oct. 17, 1977. This application Jan. 9, 1978, Ser. No. 867,784

Int. Cl.[2] B27B *27/02*

U.S. Cl. 83—409 7 Claims



1. A workpiece supporting apparatus mountable upon the work surface of a power tool for translating a workpiece past the cutting member of the power tool to produce a straight precision cut in the workpiece, said apparatus comprising in combination:

(a) an elongated keying member having an upper surface and a lower surface;

(b) vertical slot means disposed in said keying member and extending intermediate the upper and lower surfaces thereof, said slot means including a laterally expanded portion having sidewalls and a shoulder;

(c) first and second workpiece engaging means oriented upon said keying member in opposed relationship to one another for engaging opposed end surfaces of the workpiece, each of said first and second workpiece engaging means comprising:

i. means for retaining an end surface of the workpiece;

ii. a body for supporting said retaining means;

iii. post means extending upwardly through said slot means for securing said body to said keying member, said post means being slidable along said slot means to accommodate different length workpieces and including head means for engaging said side walls to prevent rotation of said post means and for engaging said shoulder to limit upward travel of said post means; and

iv. means for securing said body upon said post means and frictionally locking said head against said shoulder; and

(d) means for slidably maintaining said keying member in parallel relationship to the cutting member, said maintaining means including a guide for receiving said keying member and means for fixedly appending said maintaining means to the work surface;

whereby, said maintaining means guides the keying member supported workpiece past the cutting member.

4,164,883

GUIDE FOR A SAWBLADE

Leopold Jägers, Rudolf-Diesel-Strasse 1, 5350 Euskirchen, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,445

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646515

Int. Cl.[2] B23D *45/02*

U.S. Cl. 83—488 8 Claims

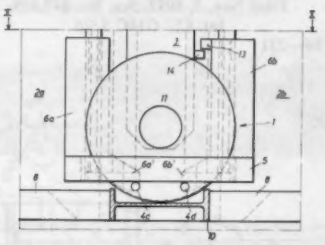
1. A machine for cold sawing of workpieces, particularly metallic workpieces, comprising:

a circular vertical saw blade;

vertical feed means for feeding said saw blade;

gliding elements lying laterally against said saw blade for guiding said saw blade vertically;

drive means for driving said saw blade;



said gliding elements being guided movably relative to said saw blade and parallel to the plane of said saw blade.

4,164,884

DEVICE FOR PRODUCING A CHORUS EFFECT

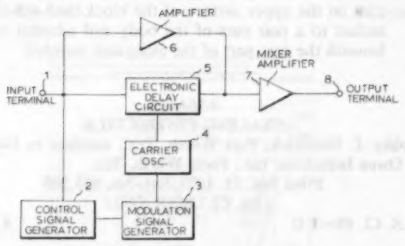
Ikutaro Kakehashi, Osaka, Japan, assignor to Roland Corporation, Japan

Continuation of Ser. No. 698,147, Jun. 21, 1976, abandoned. This application Feb. 1, 1978, Ser. No. 874,320

Claims priority, application Japan, Jun. 24, 1975, 50/79153; Apr. 6, 1976, 51/38914

Int. Cl.[2] G10H *1/04;* H03H *7/30*

U.S. Cl. 84—1.24 6 Claims



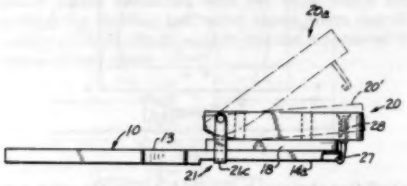
1. A device for producing a chorus effect in an electronic musical instrument, comprising an electronic delay circuit having an input terminal to which a musical tone signal is supplied and a clock terminal to which a carrier oscillator signal is supplied for producing a time delay in the musical tone signal according to the frequency of the carrier oscillator signal, a non-modulating amplifier means coupled in parallel with said electronic delay circuit, mixing amplifier means coupled to the outputs of said electronic delay circuit and said non-modulating amplifier means for mixing the outputs thereof, a carrier oscillator coupled to said clock terminal of said electronic delay circuit for generating a carrier oscillator signal and normally oscillating at a relatively high frequency, a modulation signal generating means coupled to said carrier oscillator and said electronic delay circuit for detecting the musical tone signal input to said electronic delay circuit and for frequency modulating the carrier oscillator signal generated by said carrier oscillator toward lower oscillator frequencies only when a musical tone signal input is detected, whereby the delay time of said electronic delay circuit is modulated only when a musical tone signal input exists and when no musical tone signal exists, the carrier oscillator signal is not subjected to frequency modulation, the noise in said electronic delay circuit is not time delay modulated and any jarring effect in the output thereof is substantially eliminated.

4,164,885

LIFTS FOR PEDALS OF MUSICAL INSTRUMENTS

Thomas P. Averette, 14277 Bochee Rd., Apple Valley, Calif. 92307

Filed Nov. 2, 1977, Ser. No. 847,839
Int. Cl.[2] G10C *3/26*
U.S. Cl. 84—231 **10 Claims**



1. A lift for a depressable foot pedal of the type having an elongated member with a foot block on its upper surface, said lift comprising:

a body dimensioned to be positioned on the top of the block;

a U-shaped bracket having a base adapted to pass beneath the elongated member, and having a pair of side members adapted to extend upwardly from the base along opposite sides of the member and the block;

means adapted to attach the side members to a front part of the body, this means comprising bolt means; and

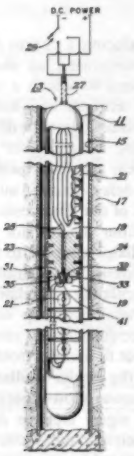
means adapted to tension the side members between the base and said front part of the body, thereby securing the body on the top of the block, this said means comprising a cam surface at the forward underside of the body adapted to cam on the upper surface of the block, and a J-hook attached to a rear part of the body and adapted to hook beneath the rear part of the elongated member.

4,164,886

SEALING PROJECTILE

Bobby J. Hallmark, Fort Worth, Tex., assignor to Gearhart-Owen Industries, Inc., Forth Worth, Tex.

Filed Sep. 21, 1977, Ser. No. 835,205
Int. Cl.[2] E21B *43/11*
U.S. Cl. 89—1 C **4 Claims**



1. An improved sealing projectile for use in a borehole perforating tool of a type wherein there is an explosive charge such as one or more shaped charge units disposed in each of a plurality of chambers that are located one above the other, with a partition means between each two adjacent chambers and sealingly isolating the adjacent chambers but for a passageway in the partition means through which ignition wires are passed, with a sealing projectile driven into sealing relation with the lower end portion of the passageway upon detonation of the explosive charge in the lower one of the adjacent chambers; said improved sealing projectile comprising:

a. a guide portion having a cylindrical exterior surface adapted for mating with the interior surface of said passageway and having slot means extending longitudinally of the guide portion from its outer end inwardly a distance less than the length of said guide portion but sufficient to permit an end portion of the guide portion to be disposed within said passageway while permitting ignition wires to pass from said passageway through said slot means to the lower one of said adjacent chambers, and

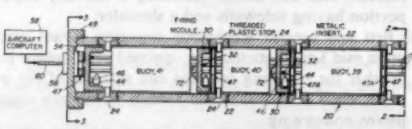
b. a sealing portion merging with said guide portion.

4,164,887

MULTIPLE BUOY LAUNCHER

Charles W. Ouellette, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1978, Ser. No. 866,209
Int. Cl.[2] F41F *5/02*
U.S. Cl. 89—1.5 R **3 Claims**



1. A launcher comprising:

a launching tube having longitudinal electrical conductors therein, said launching tube having longitudinal guides therein;

means positioned along a wall of said tube for locating buoys therein, each of said buoys having means for slidably contacting said guides for orienting said buoys about an axis of said tube, said contact making slidable electrical contact with one of said conductors; and

a set of firing modules positionable within said tube in alternating locations with said buoys, each of said firing modules being coupled to one of said contacts for contacting a specific one of said longitudinal conductors to permit individual activation of said firing modules in response to electrical signals coupled via said electrical conductors.

4,164,888

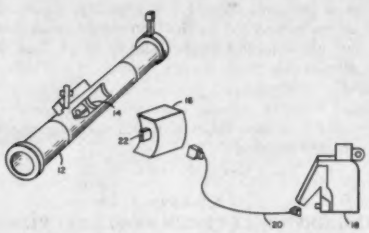
ROCKET REMOTE ENGAGEMENT MECHANISM

Lonnie L. Looger, Madison, and Bernie J. Cobb, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 1, 1977, Ser. No. 829,852
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.814 **3 Claims**

1. A rocket engagement mechanism for pre-aiming and remotely firing a rocket comprising: a rocket launcher provided with a firing element; a firing device disposed for actuating said firing element; said firing device including a squib provided with explosive means and a movable piston and a button for effecting launch of said rocket, said button being

depressed when said piston is moved by activation of said explosive means; means located remotely from said rocket for



generating an electrical signal and means for transmitting said signal to said firing device.

4,164,889

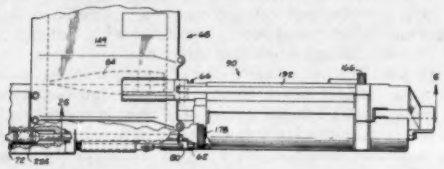
LIQUID PROPELLANT MODULAR GUN INCORPORATING DUAL CAM OPERATION AND INTERNAL WATER COOLING

Lester C. Elmore, Portola Valley, Calif., and Thomas M. Broxholm, deceased, late of Palo Alto, Calif. (by Anne K. Broxholm, administratrix), assignors to Pulsepower Systems, Inc., San Carlos, Calif.

Division of Ser. No. 616,822, Sep. 25, 1975, Pat. No. 4,062,266. This application Sep. 19, 1977, Ser. No. 834,336

Int. Cl.[2] F41F *1/04*

U.S. Cl. 89—7 **3 Claims**



3. A method of stopping automatic operation of a liquid propellant gun of the kind having a cyclic mechanism which includes a rotatable, mechanical control element for automatically loading and firing individual projectiles one-by-one in sequence so long as the gun is operated in a trigger on condition, said method comprising,

detecting a misfire of a projectile during the automatic firing mode of operation, and

stopping operation of the cyclic mechanism, after detection of the misfire, by moving the rotatable, mechanical control element part of the cyclic mechanism out of operative engagement with the rest of the cyclic mechanism.

4,164,890

LIQUID PROPELLANT MODULAR GUN INCORPORATING DUAL CAM OPERATION AND INTERNAL WATER COOLING

Lester C. Elmore, Portola Valley, Calif., and Thomas M. Broxholm, deceased, late of Palo Alto, Calif. (by Anne K. Broxholm, administratrix), assignors to Pulsepower Systems, Inc., San Carlos, Calif.

Division of Ser. No. 616,822, Sep. 25, 1975, Pat. No. 4,062,266. This application Sep. 19, 1977, Ser. No. 834,688

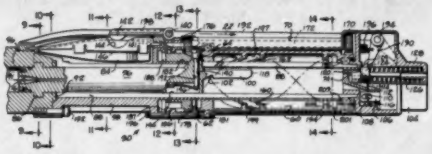
Int. Cl.[2] F41D *3/06*; F41F *11/00*

U.S. Cl. 89—185 **5 Claims**

1. A drive cam for reciprocating a bolt back and forth between a rearward, projectile loading position and a forward, projectile firing position in a gun, said drive cam comprising,

a hollow cylindrical member having a longitudinal axis disposed parallel to the axis of reciprocation of the bolt and mounted for rotation about said longitudinal axis,

a first spiral cam track formed on the inside of the hollow cylindrical member and engageable with a cam follower on the bolt to drive the bolt forward, and



a second spiral cam track separate from the first spiral cam track and formed on the interior of the hollow cylindrical member and engageable with the cam follower of the bolt to drive the bolt rearward and wherein the hollow cylindrical member includes dwell area means at the front and rear for permitting rotation of the hollow cylindrical member without producing axial movement of the bolt.

4,164,891

MACHINE FOR SIMULTANEOUSLY MILLING OF SEVERAL GROOVES IN ROTATING WORKPIECES

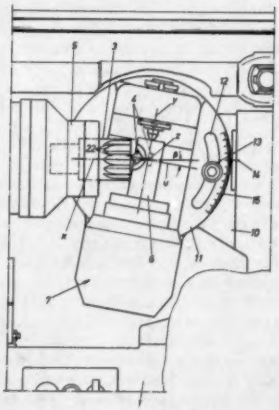
Karl Lieser, Wuppertal, Fed. Rep. of Germany, assignor to Hermann Werner GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Nov. 1, 1977, Ser. No. 847,547

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650955

Int. Cl.[2] B23C *3/28*

U.S. Cl. 409—165 **8 Claims**



1. A machine for simultaneously milling several grooves in rotating workpieces by means of a rotating one-toothed milling tool, wherein the rotational speeds of the milling tool and the workpiece stand in a ratio determined by the number of grooves, wherein the milling tool in the longitudinal direction from the free end of the workpiece is plunged cuttingly in the workpiece which is advanced in a longitudinal movement, the workpiece defining a rotational axis, comprising

a tool carrier adapted to carry a cutter tool and operatively rotatably mounted about a first axis, a rotational plane of the cutter tool being defined by rotation of said tool carrier about said first axis,

said tool carrier being additionally pivotably mounted about a second axis extending perpendicularly to the rotational axis of the workpiece such that said rotational plane of the

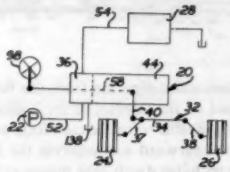
cutter tool is able to be brought in an acute angle relative to the rotational axis of the workpiece.

4,164,892

CONTROL APPARATUS

Raymon L. Goff, Wooster, Ohio, and Jim L. Rau, Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio

Filed Dec. 22, 1976, Ser. No. 753,589
Int. Cl.[2] F15B 9/10
U.S. Cl. 91—375 A **6 Claims**



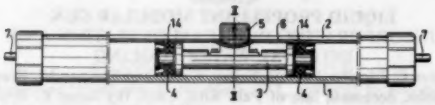
1. Control apparatus for use in a vehicle having a single pump for supplying fluid to effect turning movement of steerable wheels and operation of an auxiliary apparatus, said control apparatus comprising a housing, a main chamber disposed within said housing, a movable piston disposed in said main chamber and dividing said main chamber into first and second variable volume chambers, a movable output member connected with said housing and steerable wheels, means disposed within said housing for transmitting drive forces from said piston to said output member to effect movement of said output member and turning of the steerable wheels upon movement of said piston, a generally cylindrical valve chamber disposed in said housing, a plurality of passage means for connecting said valve chamber in fluid communication with the pump, the auxiliary apparatus, said first variable volume chamber and said second variable volume chamber, a circular array of ports disposed about the central axis of and connected in fluid communication with the cylindrical valve chamber, said circular array of ports including a first plurality of ports connected in fluid communication with the one of said plurality of passage means connected in fluid communication with the pump, a second plurality of ports connected in fluid communication with the one of said plurality of passage means connected to fluid communication with the auxiliary apparatus, and a third plurality of ports connected in fluid communication with the one of said plurality of passage means connected in fluid communication with said first variable volume chamber, a rotatable valve member disposed in said valve chamber in a coaxial relationship with said circular array of ports, means for retaining said valve member against axial movement relative to said housing, a plurality of longitudinally extending land means formed on said valve member for cooperating with said circular array of ports to effect a variation in the fluid pressure in at least some of said passage means upon rotation of said valve member about the central axis of said valve chamber, said valve member being rotatable relative to said circular array of ports in a first direction from an initial position to a first actuated position relative to said circular array of ports and being rotatable relative to said circular array of ports in a second direction from the initial position to a second actuated position relative to said circular array of ports, said first plurality of ports being connected in fluid communication with said second plurality of ports when said valve member is in said initial position to enable fluid to flow from the pump to the auxiliary apparatus, said longitudinally extending land means on said valve member being effective to direct fluid flow from at least some of said first plurality of ports through said third plurality of ports to said passage means connected in fluid communication with said first variable volume chamber and to block fluid flow to said second plurality of ports upon rotation of said valve member to said first actuated position to provide fluid flow to said first variable volume chamber in preference to the auxiliary apparatus upon rotation of said valve member to said first actuated position, said longitudinally extending land means on said valve member being effective to direct fluid flow from at least one of said first plurality of ports to said passage means connected in fluid communication with said second variable volume chamber and to block fluid flow to said second plurality of ports upon rotation of said valve member to said second actuated position to provide fluid flow to said second variable volume chamber in preference to the auxiliary apparatus upon rotation of said valve member to said second actuated position.

4,164,893

SEALING DEVICE AT PRESSURE FLUID CYLINDERS

Bo Granbom, 9 Frejgatan, and Gunnar Lundqvist, 7 Spinnaregatan, both of Stockholm, Sweden

Filed Aug. 4, 1977, Ser. No. 821,722
Int. Cl.[2] F01B 29/00
U.S. Cl. 92—88 **7 Claims**



1. A pressure fluid cylinder device comprising a cylinder, a longitudinal slot in said cylinder, a sealing structure, and a driver attached to a piston movable in said cylinder, said driver extending through said slot, said sealing structure comprising

a strip positioned to overlie said slot in sealing relation, said strip extending into sealing contact with the inside surface of said cylinder on opposite sides of said slot in that area of said slot through which said driver does not extend, that strip sealing inside surface area of said cylinder having a cross-sectional radius greater than the cross-sectional radius of that cylinder surface area never in contact with said strip, and said strip on the inside surface thereof being chamfered toward its edges so that the height of the opposed strip edges is no greater than 0.1 mm, and

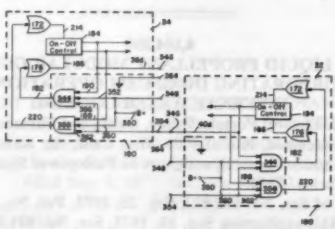
a sealing sleeve connected to said piston at each end thereof, said sealing sleeve being structured to cooperate with said strip to maintain a sealed relation therebetween.

4,164,894

SIMULTANEOUS STATE PREVENTION SYSTEM

Clarence T. Yamanaka, Carson, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,111
Int. Cl.[2] B64D 13/00
U.S. Cl. 98—1.5 **7 Claims**



1. An aircraft cabin pressure control system comprising:

first controller means selectively connectable in an on condition for controlling cabin pressure and an off condition not controlling cabin pressure;

second controller means selectively connectable in an on

condition for controlling cabin pressure and an off condition not controlling cabin pressure;

interconnect circuit means on said first controller means responsive to the conditions of said first and second controller means for changing the condition of the first controller means to the on condition when both of said controller means are in the off condition and for changing the condition of the first controller means to the off condition when both controller means are in the on condition;

interconnect circuit means on said second controller means responsive to the conditions of said first and second controller means for changing the condition of the second controller means to the on condition when both of the controller means are in the off condition and changing the condition of the second controller means to the off condition when both of the controller means are in the on condition; and

means for disabling operation of one of said first and second interconnect circuit means.

4. A method of controlling cabin pressure including a first controller means having an on condition and an off condition, a second controller means having an on condition and an off condition, an interconnect circuit means responsive to said on and off conditions of both controllers, said method including the steps of:

producing a first signal in said interconnect circuit means corresponding to the on condition of said first controller means;

producing a second signal in said interconnect circuit means corresponding to the on condition of said second controller means; and

responsive to simultaneous existence of said first and second signals in said interconnect circuit means, changing said first controller to the off condition and maintaining the second controller in the on condition.

4,164,895

MODE INDICATION SYSTEM

Howard P. Aldrich, Rancho Palos Verdes; Glenn A. Burgess, Downey, and Clarence T. Yamanaka, Carson, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,112
Int. Cl.[2] B64D *13/00*
U.S. Cl. 98—1.5 **5 Claims**

1. A system for controlling pressurization of an aircraft cabin from a source of pressurized air during successive flights of an aircraft, said system comprising:

two cabin pressure controllers for controlling pressurization by said source;

means for selectively connecting one of said controllers as primary controller for controlling cabin pressure during one flight of the aircraft;

means for connecting the other of said controllers as primary controller for controlling cabin pressure during a successive flight of the aircraft; and

annunciating means operably associated with each of said controllers for annunciating the identity of the primary controller.

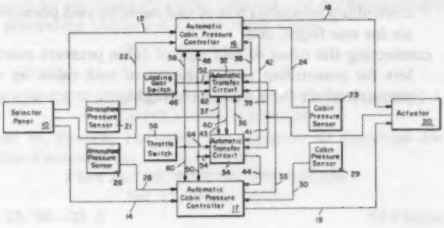
4. A method for controlling cabin pressure in an aircraft including a source of pressurized air and two cabin pressure controller means, said method comprising the steps of:

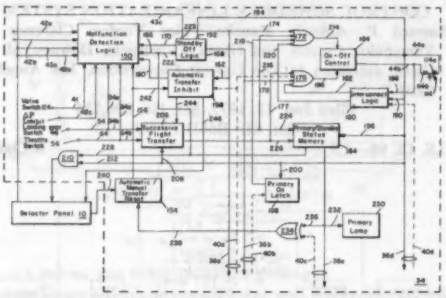
connecting one of said controller means as primary to control pressurization of said cabin from said source;

producing a sensory detectable response to identify said one controller means as primary;

connecting the other of said controller means as standby to monitor the performance of said primary controller means;

connecting said standby controller means to control cabin pressure and disconnecting said primary controller means from cabin pressure control upon malfunction of said primary controller means; and





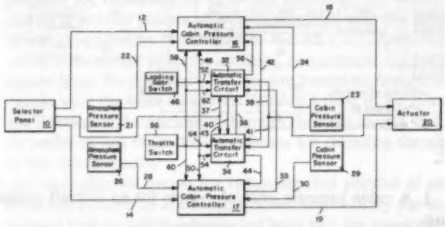
preventing change of designation of said one controller means as primary upon occurrence of said malfunction.

4,164,896

CONTROL ALTERNATING SYSTEM

Howard P. Aldrich, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,113
Int. Cl.[2] B64D *13/00*
U.S. Cl. 98—1.5 **19 Claims**



1. A system for controlling pressure in an aircraft cabin fed by a source of pressurized air, said system comprising:

flow regulating means for regulating aircraft cabin pressurization resulting from inflow of pressurized air;

first and second control means, each operably connectable to said flow regulating for independently controlling regulation of said air pressure; and

connecting means for selectively connecting said first control means for controlling said flow regulating means during one flight of said aircraft and connecting said second control means for controlling said flow regulating means during a successive flight of said aircraft.

15. A method for regulating cabin air pressure in an aircraft containing a source of pressurized air and a pair of cabin pressure controllers, said method comprising the steps of:

providing pressurized air from said source for pressurizing said cabin;

connecting one of said pair of cabin pressure controllers for controlling pressurization of said cabin by said pressurized air for one flight; and

connecting the other of said pair of cabin pressure controllers for controlling pressurization of said cabin by said pressurized air for a successive flight.

4,164,897

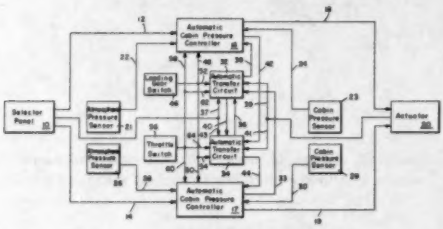
CONTROL SCHEDULE LINEARIZATION SYSTEM

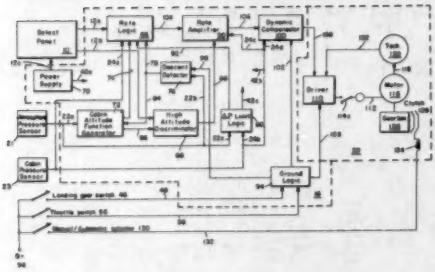
Howard P. Aldrich, Rancho Palos Verdes; Clarence T. Yamanaka, Carson, and Glenn A. Burgess, Downey, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,114

Int. Cl.[2] B64D *13/00*

U.S. Cl. 98—1.5 **6 Claims**





1. A cabin pressure control system for an aircraft comprising:

atmospheric pressure means for generating a response to atmospheric pressure;

means for generating a response to cabin pressure;

command means responsive to said atmospheric pressure response and producing an output, P_c, in accordance with the equation

$$P_c = \frac{K_1}{K_2 + \frac{K_3}{P_a}}$$

wherein K_1, K_2 and K_3 are constants and P_a is said atmospheric response; and

means for comparing P_c with said cabin pressure response and producing a comparison response for controlling cabin pressure.

4,164,898

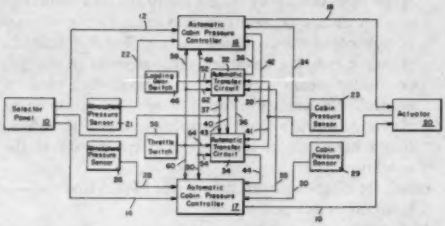
EXCESSIVE RATE DETECTION SYSTEM

Glenn A. Burgess, Downey, and Clarence T. Yamanaka, Carson, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,115

Int. Cl.[2] B64D *13/00*

U.S. Cl. 98—1.5 **8 Claims**



1. A system for controlling cabin pressure in an aircraft, said system comprising:

controller means for regulating cabin pressure;

means for selecting a maximum rate of pressure change for said controller; and

monitoring means for detecting actual rate of cabin pressure change and producing a response when actual rate of cabin pressure change exceeds said maximum rate of cabin pressure change by a predetermined amount.

6. A method for controlling cabin pressure in an aircraft including a controller means for regulating cabin pressure, means for selecting a rate of cabin pressure change and monitoring means for detecting the actual rate of cabin pressure change, said method including the steps of:

directing a maximum rate of cabin pressure change;

comparing said actual rate of cabin pressure change with said directed rate of cabin pressure change; and

producing a sensory detectable change whenever said actual rate exceeds said directed rate by a predetermined amount.

4,164,899

PRESSURE DIFFERENTIAL SYSTEM

Glenn A. Burgess, Downey, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,119

Int. Cl.[2] B64D *13/00*

U.S. Cl. 98—1.5 **8 Claims**

1. A cabin pressure control system for aircraft, said system comprising:

controller means for regulating cabin pressure rate of change in a predetermined manner;

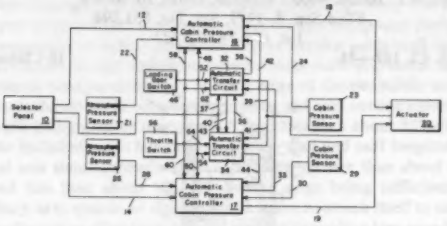
relationship means for producing an output representing a relation of cabin pressure and external pressure;

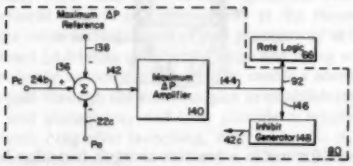
means responsive to said output for incrementing said cabin pressure rate of change when said output exceeds a preselected value;

standby controller means;

transfer means for monitoring performance of said controller means and including means for disconnecting said controller means and connecting said standby controller means for regulating cabin pressure rate of change upon malfunction of said controller means; and

means responsive to said output for preventing disconnection of said controller means and connection of said





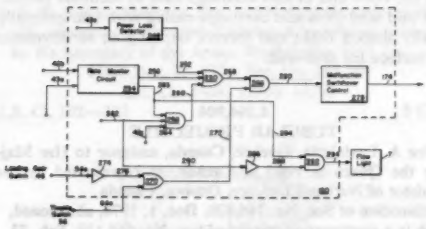
standby controller means when said output exceeds said preselected value.

4,164,900

FLOW ANNUNCIATION SYSTEM

Howard P. Aldrich, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,120
Int. Cl.[2] B64D *13/04*
U.S. Cl. 98—1.5 **10 Claims**



1. In an aircraft pressure control system having air flow control valve means and means for adjusting said valve means to provide a desired value of aircraft pressure, the improvement comprising:

means for generating a first signal whenever said air flow control valve means is in a position for providing maximum pressurization of said aircraft;

means for generating a second signal whenever pressurization of said aircraft is decreasing; and

flow response means responsive to simultaneous occurrence of said first and second signals for producing a flow response designating that maximum available air inflow is insufficient to provide said desired value of aircraft pressure.

7. In an aircraft pressure control system having air flow control valve means and means for adjusting said valve means to provide a desired value of aircraft pressure, the improvement comprising:

means for monitoring system performance and generating an error signal upon system malfunction;

flow response means responsive to relation between air inflow and air outflow for producing a flow response whenever available air inflow is insufficient to provide said desired value of aircraft pressure; and

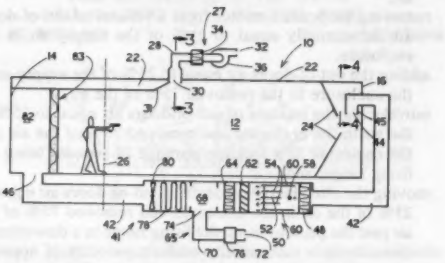
means for receiving said flow response and correspondingly preventing utilization of said error signal.

4,164,901

INDOOR GUN FIRING RANGE ENCLOSURE HAVING A VENTILATION SYSTEM

Robert W. Everett, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Jan. 16, 1978, Ser. No. 869,834
Int. Cl.[2] F24F *13/00*
U.S. Cl. 98—33 A **12 Claims**



1. An indoor gun firing range comprising:

an enclosure having an uprange end wall, a downrange end wall spaced from and generally parallel to the uprange end wall, two spaced apart side walls interconnecting the uprange end wall and downrange end wall, and a ceiling;

gun shooting positions located a distance from the uprange end wall;

a bullet trap located proximate the downrange end wall;

an air exhaust system for removing a portion of the air from the interior of the enclosure, cleaning the air so removed and exhausting the cleaned air to the out-of-doors comprising duct means having an inlet means open to the interior of the enclosure disposed at the ceiling of the enclosure at a location downrange from the gun shooting position for removing air from the enclosure; particulate matter separator means in communication with the duct means downstream of the inlet to the duct for separating particulate matter from the air being conveyed in the duct means from the enclosure; air moving means in communication with the duct means for causing a flow of air from the interior of the enclosure through the duct means; and, an outlet means from the duct means for releasing the air to the out-of-doors;

an air recirculation system for removing that portion of air from the interior of the enclosure not removed by the air exhaust system and re-introducing back into the interior of the enclosure, comprising duct means having inlet means open to the interior of the enclosure proximate the downrange end of the enclosure for removing air from the enclosure; particulate matter separation means in communication with the duct means downstream of the inlet means to the duct means for separating particulate matter from the air being conveyed in the duct means; air moving means in communication with the duct means for causing a flow of air from the interior of the enclosure through the duct means; and, an outlet means from the duct means open to the interior of the enclosure proximate the uprange wall of the enclosure for discharging air back into the enclosure; and,

an out-of-doors air make-up system in gaseous communication with the duct means of the air recirculation system for replacing at least a portion of the air removed from the

interior of the enclosure by the air exhaust system with out-of-doors air.

11. A method of ventilating air indoor gun firing range enclosure, which comprises:

continuously removing approximately 30% of the supply air from the enclosure at a location downrange of persons using the firing range;

removing particulate matter from this removed 30% of the air;

exhausting this removed 30% of the supply air to the out-of-doors;

continuously removing approximately 75% of the supply air from the enclosure at a location proximate the target area at which the persons using the range are shooting;

removing particulate matter from this removed 75% of the air;

removing particulate matter from a volume of out-of-doors are substantially equal to 25% of the supply air in the enclosure;

adding the out-of-doors air equal to 25% of the supply air in the enclosure to the removed 75% of the air;

introducing the mixture of out-of-doors air equal to 25% of the air in the enclosure and removed 75% of the air into the enclosure at a location uprange of persons using the firing range; and,

moving the introduction mixture of out-of-doors air equal to 25% of the air in the enclosure and removed 75% of the air past the persons using the firing range in a downstream direction at a substantially uniform velocity of approximately 75 feet per minute (plus or minus 8%) across the width and height of the enclosure.

4,164,902

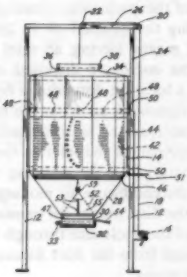
FERMENTATION TANK

Adrianus Maarleveld, San Carlos, Calif., assignor to Fleming-Potter Company, Inc., Peoria, Ill.

Filed Sep. 6, 1978, Ser. No. 940,113

Int. Cl.[2] C12G *1/02*

U.S. Cl. 99—277.1 **10 Claims**



1. An improved wine fermentation tank comprising, in combination:

an outer tank having a generally cylindrical side wall, a top opening and a convergent bottom wall having a generally inverted frusto-conical shape defining a bottom discharge opening at the bottom of the tank;

an inner screen concentric with the outer tank wall defining a cavity for receipt of crushed grapes, said inner screen forming a narrow annular channel between the inner screen and the tank, said inner screen being sealed at its lower end against the tank to define a region for receipt of juice from the crushed grapes;

at least one side discharge opening in the tank side wall above the convergent bottom wall for receipt of juice from the annular channel; and

a removable screen positioned over the bottom discharge opening, said bottom discharge opening including a fluid discharge outlet and a solids outlet door.

4,164,903

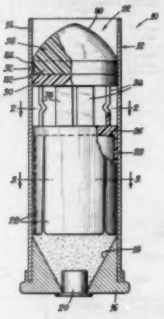
SHOTGUN WAD FOR USE AS A PRACTICE PROJECTILE

Gordon F. Bouza, 4433 Castlebar, Boise, Id. 83703

Filed Sep. 8, 1977, Ser. No. 831,594

Int. Cl.[2] F42B *5/22*

U.S. Cl. 102—41 **10 Claims**



6. A wad for use in a practice shotgun cartridge having a tubular casing of predetermined longitudinal length with a closed end and an open opposite end, said wad including a first cup portion normally adapted to contain a shot loading and having a second cup portion normally adapted to contain a charge, said wad having a generally conically shaped flight end on second cup portion extending axially outwardly thereof in a direction opposite to said first cup portion to facilitate insertion of said wad into a cartridge casing with said first cup portion facing the closed end of said cartridge casing, said first cup portion including a plurality of longitudinal fingers extending in a direction opposite to said flight end, said wad having a longitudinal length such that said wad may be substantially fully received within said tubular casing with said flight end facing the open end of said cartridge case to facilitate projection of said wad from said cartridge casing with said generally conically shaped flight end thereof defining an aerodynamic flight surface for said wad.

4,164,904

TUBULAR PROJECTILE

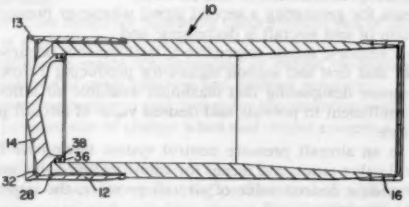
Maurice A. Laviolette, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Continuation of Ser. No. 746,820, Dec. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 660,120, Feb. 23, 1976, abandoned, which is a continuation of Ser. No. 521,138, Nov. 5, 1974, abandoned. This application Aug. 24, 1978, Ser. No. 936,391

Claims priority, application Canada, Nov. 16, 1973, 185955; Aug. 30, 1974, 208146

Int. Cl.[2] F42B *13/20*

U.S. Cl. 102—92.7 **5 Claims**



1. A range limited practice projectile adapted to be fired at supersonic velocity from a gun barrel, and comprising: a tubu-

lar body of substantially circular cross-section and 105 mm outside diameter, having a longitudinal axis, a leading inlet end and a trailing exit end and a central passageway extending therethrough, and wherein the leading end of the body is in the form of an annular wedge, the latter being a composite wedge comprising an inside wedge having an annular inner wall, and an outside wedge having an annular outer wall, said inside and outside wedges defining a leading edge of the projectile with the included angle between said inside and said outside annular walls being greater than about 5° and less than about 15° with the included angle between said inner wall and said longitudinal axis simultaneously therewith being greater than about 3° and less than about 10°, the leading edge being sufficiently sharp as to enable an oblique shock wave to attach itself to said leading edge after launching to assist in providing low aerodynamic drag on the projectile, the internal diameter of the central passageway decreasing from the leading inlet end along said annular inner wall to a throat region, the ratio of the cross-sectional area of said passageway in the throat region (A_t) to the cross-sectional area of said passageway at the leading inlet end (A_i) being sufficiently large and being so related to the projectile velocity at launch as to enable a normal shock wave to pass through the throat region to establish supersonic flow in said passageway and thus provide a relatively low aerodynamic drag after launching, with said ratio A_t/A_i also being a value less than 1.0 so that as the velocity of the projectile decreases to a predetermined flight Mach number, the shock wave is expelled from the passageway to establish choked flow conditions in said passageway and relatively high aerodynamic drag whereby to limit the range of the projectile, and wherein the wall thickness ratio of the projectile t/R is from about 0.197 to not greater than 0.45 where:

t=maximum wall thickness

R=maximum radial distance from projectile axis to outside surface of projectile.

4,164,905

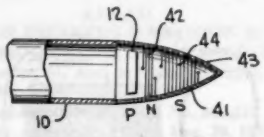
LUMPED NEUTRALIZATION COIL ARRANGEMENT FOR INDUCTANCE FUZE

Hans W. Kohler, Sarasota, Fla., and Helmut Sommer, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1971, Ser. No. 211,140

Int. Cl.² F42C *13/08, 19/00*

U.S. Cl. 102—212 **5 Claims**



1. An inductance proximity fuze comprising:

(a) A primary coil;

(b) Means for applying current to said primary coil to establish a magnetic field having an infinite number of field lines;

(c) A passive secondary coil having a first number of turns and disposed relative to said primary coil such that said first number of turns are traversed by a first portion of said field lines;

(d) A passive neutralizing coil having a second number of turns connected in series opposition to said secondary coil and disposed relative to said primary coil such that the second number of turns are traversed by a second portion of said field lines and such that under free space conditions the product of said first portion of field lines and said first number of turns is approximately equal to the product of said second portion of field lines and said second number of turns; said primary, secondary, and neutralizing coils being wound symmetrically about a common axis which coincides with the longitudinal axis of said proximity fuze;

(e) Means connected to said secondary coil and said neutralizing coil for detecting any voltage differences induced therein by magnetic field disturbance of said free space magnetic conditions; and

(f) Means for initiating operation of a fuze in response to a predetermined voltage difference existent across said secondary coil and said neutralizing coil.

4,164,906

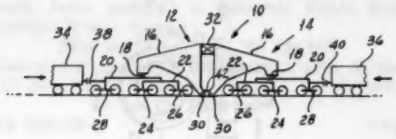
SCHNABEL CAR BOGIE

Leslav M. Nieviarovski, Yonkers, N.Y., assignor to Norca Corporation, Great Neck, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,700

Int. Cl.² B61D *3/12, 3/16, 15/02, 49/00*

U.S. Cl. 105—367 **20 Claims**



1. In a multiple span bolster railway car adapted to be subjected to the effect of compressive forces when making up part of a train of cars traveling along a railway, apparatus including in combination an upper span bolster, a lower span bolster for pivotally supporting the inboard end of said upper span bolster, trucks for supporting said inboard lower span bolster on said railway, means for supporting the outboard end of said upper span bolster on said railway, first means for reducing the tendency of said inboard lower span bolster to move upwardly in response to compressive forces applied to said assembly and second means for restraining said upper span bolster against pivotal movement relative to said lower span bolster to inhibit misalignment of said upper and lower span bolsters in the directions of the length thereof in response to said forces.

4,164,907

DEVICE FOR STORING VALUABLES

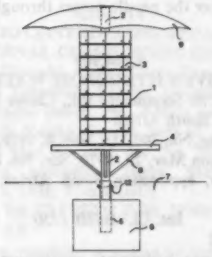
Michael Piatscheck, Eilenau 49, 2 Hamburg 76, and Dieter Sievers, Bernadottestr. 199, 2 Hamburg 52, both of Fed. Rep. of Germany (7834)

Filed Dec. 23, 1977, Ser. No. 863,975

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658920

Int. Cl.² E05G *1/08*

U.S. Cl. 109—50 **6 Claims**



1. A device for storing valuables comprising:

a hollow receiving jacket anchored in a ground support;

a multiplicity of safe deposit boxes arranged in a transportable column, said column comprising a plurality of sets of vertically-superimposed deposit boxes, disposed adjacent

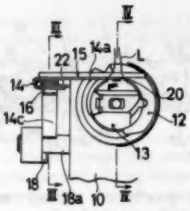
to one another, said sets being disposed side-by-side in a generally circular arrangement, said column including a centrally-arranged, single support element around which said sets of safe deposit boxes are disposed and to which said sets of safety boxes are rigidly secured, said support element having a lower portion which is receivable and releasably anchorable in said receiving jacket.

4,164,908

CHAINSTITCH FORMING DEVICE FOR SEWING MACHINES

Yujiro Takikawa, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 19, 1978, Ser. No. 870,646
Claims priority, application Japan, Feb. 1, 1977, 52-11289[U]
Int. Cl.[2] D05B *1/14*
U.S. Cl. 112—168 **3 Claims**



1. A chain stitch forming device for a sewing machine which comprises:
- a machine frame;
- a needle reciprocably mounted on said machine frame;
- a loop taker rotatably mounted on the machine frame and having a loop seizing beak thereon;
- a bobbin case retainer disposed in said loop taker adapted to receive a bobbin case therein;
- restraining means fixed to the frame for restraining the bobbin case retainer from rotation with said loop taker; and,
- a loop retaining member swingably supported on the machine frame and including a first lever portion extending along and swingably supported on the under side of said restraining means, a loop retainer extending inwardly from a free end of said first lever portion into a gap provided between said bobbin case retainer and said bobbin case for serving as a guide passage of a thread loop released from said loop seizing beak of said loop taker and a second lever portion engageable with a cam means which is actuated by a lower shaft of the sewing machine, said loop retainer of said loop retaining member being movable to a loop retaining position for temporarily holding the loop having been released from said loop seizing beak to allow the loop held by said loop retainer to be moved off therefrom after the needle passes through the loop.

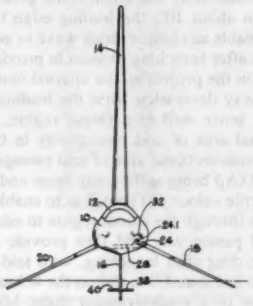
4,164,909

WIND DRIVEN HYDROFOIL WATERCRAFT

James S. Ballard, 59 Strathmore Rd., Camps Bay, Cape Town, Cape Province, South Africa

Continuation of Ser. No. 740,115, Nov. 8, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,298
Claims priority, application South Africa, Nov. 19, 1975, 75/7269
Int. Cl.[2] B63B *1/30*
U.S. Cl. 114—282 **5 Claims**

1. A wind driven watercraft comprising a buoyant hull having a fuselage frame and capable of floating on water when the craft is stationary, a singlebladed side-hydrofoil depending radially outwardly from each side of the hull in a continuously diverging direction relative to each other and at an angle below the horizontal when the craft is stationary whereby said side-hydrofoils form an inverted V-shaped configuration, said side-hydrofoils being positioned forwardly of the center of gravity of the watercraft, a single blade front hydrofoil mounted centrally between said side-hydrofoils and depending vertically downwardly from said hull, said side-hydrofoils being pivotally mounted with respect to the frame on pivotal mountings to enable the ends of said hydrofoils to be movable towards the hull about the pivotal mountings and to enable said side-hydrofoils to be pivoted independently of each other about their longitudinal axes during wind driven operation of the watercraft, a rear hydrofoil depending downwardly from



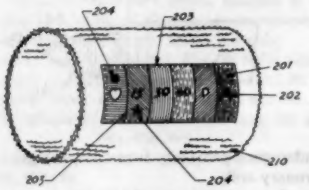
the hull, said rear hydrofoil being pivotally mounted with respect to the frame and capable of moving in a clockwise and anti-clockwise direction about its longitudinal axis to steer the craft, means for enabling wind to drive the hull forward, a cockpit towards an upper part of the hull and control means in the cockpit and linked to the side and rear hydrofoils for enabling the position of the side and rear hydrofoils about their pivotal mountings to be altered, said craft being capable of being supported and traveling on the hydrofoils when in motion.

4,164,910

SCORE REGISTERING DEVICE

Robert Feller, 2 Oriole Pl., Port Chester, N.Y. 10573

Filed Apr. 7, 1977, Ser. No. 785,316
Int. Cl.[2] A63B *71/06*
U.S. Cl. 116—225 **4 Claims**



1. An article of apparel comprising a sweatband to be worn on the wrist having mounted thereon a score registering device of flexible material comprising
- a flexible scoreboard member bearing indicia of all possible point scores permanently attached to said sweatband;
- at least one score indicator marker; means on portions of said marker for detachably fastening said marker to selected indicia on said scoreboard member in association with any of said indicia;
- said means for detachably fastening said indicator markers to said scoreboard member comprising cooperating elements of a hook and loop type fastener wherein opposite edge portions of the said scoreboard member comprises one element of said hook and loop type fastener and the por-

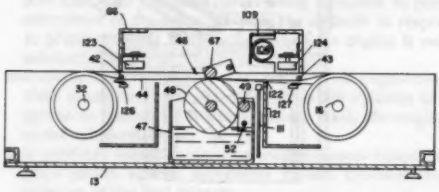
tions of said score indicator marker comprises the cooperating element of said hook and loop type fastener.

4,164,911

APPARATUS FOR RE-INKING PRINTING RIBBONS

Albert N. Nicholson, Santa Clara, Calif., assignor to Engineering Systems Corporation, Santa Clara, Calif.

Filed Sep. 19, 1977, Ser. No. 834,405
Int. Cl.[2] B05C *1/08*
U.S. Cl. 118—670 3 Claims



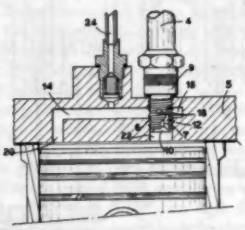
1. An apparatus for inking a printer ribbon extending between and wrapped about at least one of a pair of spools, comprising a base member; a pair of spool mechanisms secured to said base member in spaced apart relationship for supporting said spools; said spool mechanism including motor means for rotating said spools and transferring said printer ribbon therebetween; inking means, disposed between said spool mechanisms, for selectively inking said printer ribbon translating thereby; hole detector means, secured to said base member, for detecting holes in said printer ribbon, including a substantially planar transparent member having one edge adjacent to said printer ribbon and a parabolic edge extending from said one edge in convex fashion, said parabolic edge having an optical focus disposed proximate to a medial portion of said one edge, the planar surfaces and said parabolic edge being coated for total internal reflection, photoelectric pickup means disposed on said one edge proximate to said focus of said parabolic edge, means for illuminating said printer ribbon on the side thereof opposite said one edge, including a fixed light source extending the width of said printer ribbon opposite said one edge and directed thereto, and means responsive to said hole detector means, including electrical brake means for stopping said motor means with a detected hole adjacent to said hole detector means.

4,164,912

METHOD FOR REDUCING POLLUTION DUE TO AN INTERNAL COMBUSTION ENGINE

Roland R. C. Beyler, 61, Ave. du Maréchal Joffre, 94360 Bry-sur-Marne, France

Filed Dec. 28, 1977, Ser. No. 865,124
Claims priority, application France, Dec. 29, 1976, 76 39821
Int. Cl.[2] F02P *1/00*; F02B *3/00*
U.S. Cl. 123—26 5 Claims



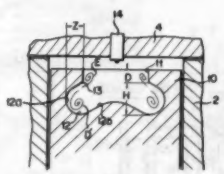
1. A method for reducing the polluting effect of an internal combustion engine which comprises a cylinder, a piston movable in the cylinder and defining with the cylinder a combustion chamber, a spark plug and means supplying a mixture of fuel and air to the cylinder, said method comprising, after the end of the normal combustion of said mixture in the combustion chamber of the engine, establishing a post-combustion by maintaining a series of high-tension sparks during a long period and introducing turbulent additional air in the vicinity of said sparks so as to form a plasma which is propagated in a residue of said mixture in the chamber, the plasma being propagated by introducing said additional air into the chamber from a plurality of points, a part of said additional air being introduced from a point near to the spark and a part of said additional air being introduced from at least another point of the combustion chamber.

4,164,913

COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE OF DIRECT INJECTION TYPE

Kunihiko Komiyama; Seikichi Kanai, and Masaru Okada, all of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 2, 1977, Ser. No. 830,345
Claims priority, application Japan, Sep. 2, 1976, 51/104309; Nov. 12, 1976, 51/151199[U]; Nov. 12, 1976, 51/151200[U]
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—30 C 7 Claims



1. In an internal combustion engine of the direct injection type including combustion chambers each defined by a cylinder head, a cylinder liner, and a piston head having a wall defining a cavity therein, means for producing air swirl in said cavity and fuel injection means each having a plurality of fuel injection nozzles, said fuel injection means being mounted substantially at the central part of said cavity, said nozzles being arranged to inject jets of fuel into said cavity radially against said cavity wall, the improvement wherein said cavity wall is constructed to define a generally equilateral polygonal cavity formed in the upper part thereof and a generally toroidal cavity formed in the lower part thereof, the ratio of the depth of said equilateral polygonal cavity to that of toroidal cavity being about 0.3 to about 1.2.

4,164,914

AIR-FUEL RATIO CONTROLLING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 31, 1977, Ser. No. 783,429
Claims priority, application Japan, May 13, 1976, 51-61051[U]; May 13, 1976, 51-61052[U]
Int. Cl.[2] F02M *7/00, 23/04*
U.S. Cl. 123—32 EE 3 Claims

1. In an internal combustion engine including a combustion chamber, an intake duct for supplying an air-fuel mixture into said combustion chamber, an exhaust pipe for conveying combustion gases from said combustion chamber to the atmosphere, a carburetor in said intake duct for producing the air-fuel mixture, and a throttle valve pivotally mounted in said intake duct downstream of said carburetor for controlling the

flow of the air-fuel mixture through said intake duct into said combustion chamber; the improvement which comprises:

an apparatus for controlling the air-fuel ratio of the air-fuel mixture supplied into said combustion chamber, said air-fuel ratio controlling apparatus including;

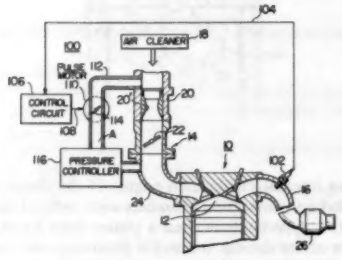
an air-fuel ratio detecting means disposed in said exhaust pipe to detect the oxygen content of the combustion gases flowing therethrough for thereby detecting the air-fuel ratio of the air-fuel mixture supplied into said combustion chamber;

a passage bypassing said carburetor and said throttle valve and having a downstream end connected to said intake duct downstream of said throttle valve for supplying an additional air into said intake duct;

air valve means in said bypass passage for controlling the cross-sectional area of said bypass passage through which said additional air is permitted to flow to said intake duct downstream of said throttle valve;

means drivingly connected to said air valve means and operatively associated with said air-fuel ratio detecting means for actuating said air valve means such that the airflow cross-sectional area of said bypass passage is increased when the detected air-fuel ratio is smaller than a predetermined value; and

pressure control means for controlling the pressure in said



bypass passage downstream of said air valve means, said pressure control means including:

a valve seat disposed in said bypass passage downstream of said air valve means;

means including a deformable diaphragm and defining first and second pressure chambers with said diaphragm;

a multi-position valve having a first port pneumatically connected to said first pressure chamber, a second port pneumatically connected to said bypass passage at a first point between said air valve means and said valve seat and a third port pneumatically connected to said bypass passage at a second point downstream of said valve seat and upstream of said combustion chamber, said second pressure chamber being communicated with a venturi in said carburetor so that said second pressure chamber is supplied with venturi vacuum;

means operatively associated said multi-position valve and responsive to variations in one of the operating conditions of the engine to actuate said valve for thereby selectively switching over the communication of said second and third ports with said first port so that said first pressure chamber is supplied with a pressure at one of said first and second points in said bypass passage; and

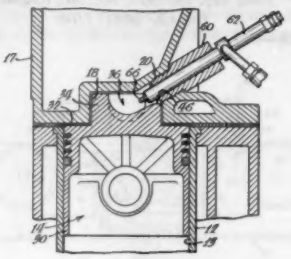
a needle valve cooperative with said valve seat to define a variable orifice and drivingly connected to said diaphragm.

4,164,915

CONVERSION OF GASOLINE TO DIESEL ENGINE

Joseph T. Kulhavy, Davenport, Iowa, and Donald G. Shelton, Burlington, Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Jun. 30, 1977, Ser. No. 811,784
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 R **15 Claims**



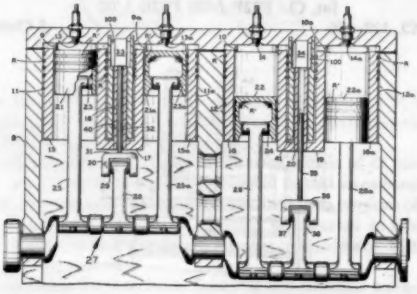
1. A method of producing a diesel engine from a gasoline engine having a plurality of cylinder bores adapted to have pistons reciprocated therein between raised and lowered positions with a cylinder head closing upper ends of said bores and defining a reduced chamber at the upper end of each bore and a spark plug opening in communication with each reduced chamber, comprising the steps of producing a piston including a cylinder portion having a size corresponding to each of said cylinder bores and a dome corresponding to and adapted to be received into said reduced chamber, forming a combustion chamber in an upper surface of said dome and aligned to be in communication with said spark plug opening, inserting one of said pistons into each of said bores, and inserting a fuel injector into each of said spark plug openings in a position to be in continuous communication with a respective combustion chamber so that movement of said piston toward said reduced chamber will initially cause said dome to be received in said reduced chamber to close off the lower end thereof and continued movement of said piston will compress the gases into said combustion chamber whereby fuel injected into said combustion chamber will be ignited therein.

4,164,916

VARIABLE DISPLACEMENT ARRANGEMENT IN FOUR CYCLE, RECIPROCATING, INTERNAL COMBUSTION ENGINE

Robert P. Wuerfel, 4620 NW. 45 Ct., Ft. Lauderdale, Fla. 33319

Filed Aug. 7, 1978, Ser. No. 931,566
Int. Cl.[2] F02B *75/04*
U.S. Cl. 123—78 C **15 Claims**



1. In a four cycle, reciprocating, internal combustion engine having a cylinder, means for introducing a fuel mixture into the cylinder, means for igniting the fuel mixture, means for ex-

hausting the burned gasses from the cylinder, and an engine crankshaft, the improvement which comprises:

a hollow outer piston reciprocable in said cylinder;

an inner piston reciprocable in said outer piston and exposed thereat to pressure of the fuel mixture introduced into the cylinder, said inner piston being operatively connected to the engine crankshaft;

yieldable means biasing said outer piston against movement in the cylinder in response to pressure of the fuel mixture, said yieldable means being operative to prevent such movement of the outer piston while the engine is under low load, said yieldable means being operative to permit movement of the outer piston in the cylinder in response to pressure of the fuel mixture while the engine is under substantial load;

and means for coupling said outer piston to the engine crankshaft when the outer piston moves in the cylinder in response to ignition of the fuel mixture while the engine is under substantial load;

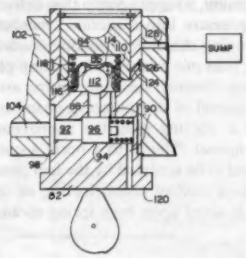
said yieldable means comprising magnet means biasing said outer piston against movement in said cylinder under pressure of the fuel mixture.

4,164,917

CONTROLLABLE VALVE TAPPET FOR USE WITH DUAL RAMP CAM

Richard E. Glasson, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 16, 1977, Ser. No. 825,178
Int. Cl.² F02D *13/04;* F01L *3/24*
U.S. Cl. 123—97 B **9 Claims**



1. Valve opening control apparatus for limiting the fully open position of a valve in an internal combustion engine having at least one reciprocating piston and an associated valve operable in selectively variable timed relationship with the piston by means of a valve train connected with a rotatable cam having circumferential portions successively engaging the valve train including a primary base circle for causing valve closure, a raised portion for causing valve opening to a predetermined upper limit and a secondary base circle recessed below the primary base circle, said control apparatus comprising

(a) extensible thrust conveying means installable within the valve train for transmitting opening and closing movement from the cam to the valve and for varying the timed relationship of valve and piston operation by varying the effective length of the valve train;

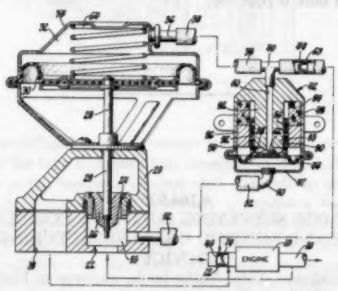
(b) control means for selectively operating said extensible thrust conveying means either in a first mode in which said thrust conveying means extends in length when the valve train is engaged by the secondary base circle of the cam and collapses during each revolution of the cam as the point of engagement of the cam with the valve train shifts from the secondary base circle to the primary base circle or in a second mode in which said extensible thrust conveying means is extended in length when the valve train engages the secondary base circle of the cam and is locked in an extended position of sufficient length to cause partial opening of the valve when the valve train is engaged by the primary base circle of the cam and in which said extensible thrust conveying means is unlocked and collapsed completely during each revolution of the cam before the valve train engages the outermost raised portion of the cam, said control means includes a position sensing means for sensing the predetermined upper limit of the valve and for causing said extensible thrust conveying means to collapse completely during the second mode whenever the valve attains this predetermined upper limit, whereby the valve may be selectively opened when the valve train is engaged by the primary base circle of the rotating cam without increasing the valve lift caused by the raised portion of the rotating cam to thereby insure proper valve piston clearance during all modes of operation.

4,164,918

EXHAUST GAS RECIRCULATION CONTROL

Raymond J. Haka, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1978, Ser. No. 879,781
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **8 Claims**



1. An exhaust gas recirculation control assembly for an engine having an induction passage for induction air flow, an exhaust passage, and an exhaust gas recirculation passage interconnecting said exhaust and induction passages, said assembly comprising a valve for controlling exhaust gas recirculation through said recirculation passage, a coil, a member electromagnetically responsive to current in said coil for creating a reference pressure, and means operating said valve to provide exhaust gas recirculation at rates which maintain a control pressure in said recirculation passage equal to said reference pressure and thus provide exhaust gas recirculation substantially proportional to induction air flow, and wherein current in said coil may be adjusted to change said reference pressure and thereby change said control pressure to effect a change in the proportion of exhaust gas recirculation to induction air flow.

4,164,919

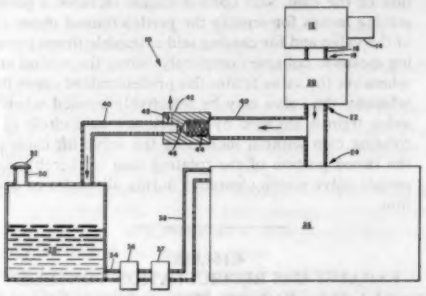
TANK VENT SYSTEM

Lewis K. Davis, Waterloo, and Kenneth J. Lowin, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 724,546, Sep. 20, 1976, abandoned. This application Apr. 18, 1978, Ser. No. 897,357
Int. Cl.² F02M *59/00*
U.S. Cl. 123—136 **6 Claims**

1. A tank vent system comprising: an internal combustion engine; air filter means for providing filtered air to said engine; a turbocharger having an inlet side operatively connected to said air filter means and an outlet pressure side operatively connected to said engine for providing filtered and pressurized air to said engine; a fuel tank having a non-vented filler cap for

containing fuel for said engine; an air line connecting the outlet pressure side of said turbo-charger to said fuel tank to cause filtered and pressurized air to replace fuel supplied to said engine; first orifice means disposed in the air line between the



outlet pressure side of said turbocharger and said fuel tank restricting air flow therebetween and second orifice means connected to the air line between the first orifice means and the fuel tank to relieve air pressure in the air line whereby pressure in the fuel tank is relieved.

4,164,920

DEVICE FOR SUPPLYING FUEL TO A COMBUSTION ENGINE AND METHOD OF MANUFACTURING SAID DEVICE

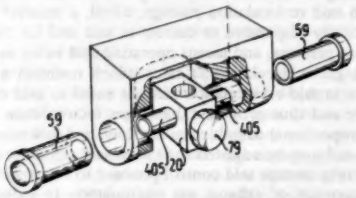
Willem Brinkman, Velp, Netherlands, assignor to Holec N.V., Hengelo, Netherlands

Filed Jan. 19, 1977, Ser. No. 760,718

Claims priority, application Netherlands, Jun. 28, 1976, 7607080

Int. Cl.[2] F02M *39/02*; F02D *1/06*; F04B *35/04*

U.S. Cl. 123—139 R **18 Claims**



1. A device for delivering fuel to a combustion engine, in which the pump chambers of at least two fuel pumps are arranged coaxially at a distance from one another, are communicating each through an inlet valve with a fuel supply and through an outlet valve with a fuel delivery port to be connected with the combustion engine and are limited by a displacer body reciprocated by driving means, said two displacer bodies and the driving means being intercoupled by means of a coupling member arranged between the two fuel pumps, characterized in that the pump chambers are provided in coaxial bores in the two ends of a bridge piece, one end being located in the pump housing of one fuel pump and the other end in the pump housing of the other fuel pump, whilst at least one intermediate piece interconnects the two ends of the bridge piece.

4,164,921

FUEL INJECTION PUMP

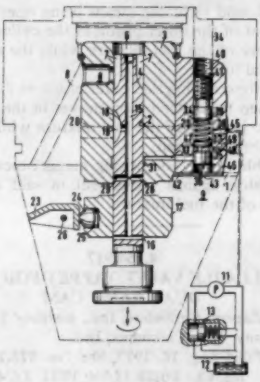
Gerald Höfer, Weissach-Flacht, and Franz Eheim, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,300

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649893

Int. Cl.[2] F02M *39/00*; F02D *1/06*

U.S. Cl. 123—139 AF **7 Claims**



1. A fuel injection pump for internal combustion engines having a housing, a supply pump that delivers fuel under rpm-dependent pressure into a suction chamber of said injection pump, a pumping chamber in communication with said suction chamber, at least one reciprocating pump piston and an associated discharge channel, said pump piston arranged to open said discharge channel of said pumping chamber that is adapted to be blocked at starting rpm, the improvement in which said discharge channel extends to a bore, a control piston in said bore arranged to be actuated by the fuel pressure of said supply pump and said control piston having an oppositely disposed face which is acted upon by a spring means.

4,164,922

TIMING CONTROL SYSTEM AFFORDING MAINTENANCE OF FUEL QUANITY DELIVERED

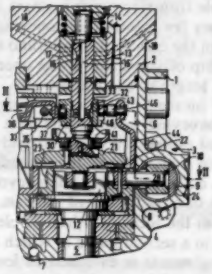
Franz Eheim, Stuttgart, and Gerald Höfer, Weissach-Flacht, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1977, Ser. No. 827,640

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638670

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 AQ **9 Claims**



1. A fuel injection pump for supplying metered quantities of

fuel to an internal combustion engine, said pump including, in combination:

a housing;

a cylinder and piston assembly within said housing;

inlet and outlet means for said cylinder;

cam actuator means for providing reciprocating motion to said piston in said cylinder;

rotary drive means for said piston;

rotating shaft means for powering said cam actuator means;

means for actuating said rotating shaft means;

adjustment means for changing and adjusting the angular position of said cam actuator means with respect to said rotating shaft means, thereby changing the fuel delivery timing;

means for supplying fuel to said housing; and

flow control means for controlling the flow of fuel from said housing to said cylinder; and wherein the improvement comprises:

coupler means connected to said flow control means and to said cam actuator means for maintaining the relative angular position between said flow control means and said cam actuator means when the angular position of said cam actuator means is changed for the purpose of changing the fuel delivery timing.

4,164,923

FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

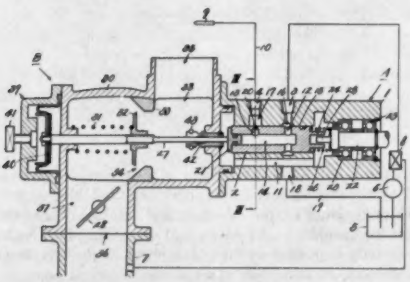
Kei Kimata, Ama; Tsugito Nakazeki, and Saburo Oshima, both of Iwata, all of Japan, assignors to NTN Toyo Bearing Co. Ltd., Osaka, Japan

Filed Jul. 30, 1976, Ser. No. 710,128

Claims priority, application Japan, Jul. 31, 1975, 50/93970; Aug. 5, 1975, 50/95691

Int. Cl.[2] F02D *1/00, 3/04*

U.S. Cl. 123—140 MC **18 Claims**



1. A fuel injection device for use with an internal combustion engine having an air suction inlet comprising a main body having a longitudinally extending cylindrical bore, a fuel supply port and a plurality of fuel metering ports communicating with said bore; each of said metering ports having a configuration in the form of a substantially triangular window opening with one of its three sides extending circumferentially; a plurality of fuel distributing ports communicating with said fuel metering ports; a cylindrical rotor disposed in said cylindrical bore of said main body; said rotor having an inlet port communicating with said fuel supply port of said main body and a metering port communicating with said inlet port and associated with said metering port of said main body; drive means for rotating said rotor in synchronism with the rotation of the internal combustion engine; control means for longitudinally sliding said rotor in accordance with the amount of air supplied by the air suction inlet of the internal combustion engine; and fuel supply means for supplying the fuel supply portion of the main body with pressurized fuel whereby the lengths of time for communication between the individual metering ports of the main body and the metering port of the rotor are controlled in connection with the r.p.m. of the engine and the amount of air supplied through the air suction inlet.

4,164,924

CENTRIFUGAL SPEED GOVERNOR FOR AN INTERNAL COMBUSTION ENGINE

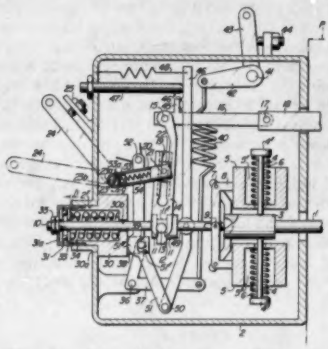
Niro Makino, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 8, 1977, Ser. No. 858,816

Claims priority, application Japan, Dec. 16, 1976, 51-151702

Int. Cl.[2] F02D *1/04*

U.S. Cl. 123—140 R **10 Claims**



1. A centrifugal speed governor for an internal combustion engine of the type that has a fuel supply system including a fuel injection pump having a control rack movable to control the fuel pump discharge, said governor comprising fly weights rotatable about a first axis in timed relationship with the engine revolution and movable radially outwardly of said first axis with the increase in the centrifugal force produced by the rotation of said fly weights, a control shaft operatively connected to said fly weights and axially movable by the radial movement of said fly weights, a floating lever operatively connecting said control shaft with said control rack of said fuel injection pump, idle spring means yieldably acting in at least an idle operating range against the centrifugal force produced by the rotation of said fly weights, main spring means yieldably acting against said centrifugal force in a high speed engine operating range, compensating means operative to suppress undue increase of the fuel pump discharge which would otherwise occur with the increase of the engine speed, said compensating means including compensating spring means yieldably acting against said centrifugal force in a compensation engine operating range between said idle and high speed engine operating ranges, an adjusting lever rotatable about a second axis between idle and full load positions, a steering lever having one end operatively connected to said floating lever at a point between the ends thereof, the other end of said steering lever being operatively connected to said adjusting lever for relative angular movement, biasing spring means operatively associated with said steering lever and operable to yieldably hold said steering lever at a predetermined stable position relative to said adjusting lever and, when said steering lever is angularly displaced from said stable position, to return said steering lever to said stable position, the point of connection between said steering and floating levers being movable substantially longitudinally of said floating lever to provide the same with a variable fulcrum about which said floating lever is rotated by the axial movement of said control shaft to move said control rack, a maximum fuel lever operative to limit the movement of said control rack toward increasing the fuel pump discharge, said maximum fuel lever being rotatable about a pivot point adjacent to one end thereof and operatively associated with said control rack at a second point remote from said pivot

point, said maximum fuel lever having a third point operatively associated with said control shaft so that said maximum fuel lever is rotated about said pivot point particularly in said compensation engine operating range to allow said control rack to follow the rotational movement of said maximum fuel lever and thus move toward increasing the fuel pump discharge so far as said biasing spring means biases said steering lever to return to said stable position, the arrangement being such that when said adjusting lever is placed at said full load position said steering lever is adapted to be held at a position angularly displaced from said stable position at the beginning of said compensation engine operating range and such that, when said maximum fuel lever is rotated about said pivot point by the axial movement of said control shaft, said steering lever is rotated about said other end thereof to move said point of connection between said steering and floating levers longitudinally of said floating lever so that said control rack is caused to follow the movement of said maximum fuel lever and move toward increasing the fuel pump discharge, and a holding lever pivotable about a point adjacent to one end thereof and having a first part operatively associated with said control shaft so that said holding lever is rotated about said one end by the axial movement of said control shaft in said high speed engine opeating range, said holding lever having a second part operatively associated with said maximum fuel lever at said pivot point so that, when said holding lever is rotated by said control shaft in said high speed engine operating range, said pivot point of said maximum fuel lever is moved in the same direction as the movement of said second part of said holding lever.

4,164,925
CENTRIFUGAL RPM GOVERNOR FOR INTERNAL COMBUSTION ENGINES

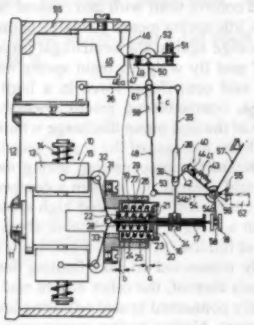
Sieghart Maier, Stuttgart; Werner Lehmann, Gerlingen; Ernst Ritter, Stuttgart; Wolfgang Eckell, Gebersheim, and Reinhard Schwartz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,510

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656261

Int. Cl.[2] F02D 1/04

U.S. Cl. 123—140 R **22 Claims**



1. In a centrifugal rpm governor for a fuel injection pump of an internal combustion engine, said pump having a fuel supply control member and a drive shaft, the governor including: a housing; centrifugal weight means, including regulating springs, mounted within the housing to the drive shaft for rotation with the drive shaft; an adjusting member connected to the centrifugal weight means and displaceable by the centrifugal weight means as a function of the rpm of the drive shaft against the force of the regulating springs; an intermediate lever connected to the adjusting member and the fuel supply control member; a setting member mounted to the housing to arbitrarily move the fuel supply control member by the intermediate lever; adjustable stop means adjustable in the direction of the longitudinal axis of the fuel supply control member, said adjustable stop means having a contoured stop surface and serving to determine the full load fuel supply quantity of the fuel pump; follower means connected at least indirectly to the intermediate lever for engagement with the contoured stop surface; and force accumulator means connected to the intermediate lever, the improvement in the governor comprising:

an angled shift lever, one arm of which is coupled to the adjusting member and the other arm of which is connected at least indirectly to the intermediate lever, said shift lever serving as a motion translating member and defining a pivot point for the follower means, wherein:

(i) the force accumulator means is stretched as soon as and as long as the intermediate lever is moved in a direction tending to move the fuel supply control member past the adjustable stop means; and

(ii) the follower means is shifted relative to the contoured stop surface by the adjusting member through the shift lever, when the adjusting member changes the position of the pivot point on the shift lever causing the follower means to engage the contoured stop surface, said shifting movement being proportional to the adapting control stroke of the adjusting member.

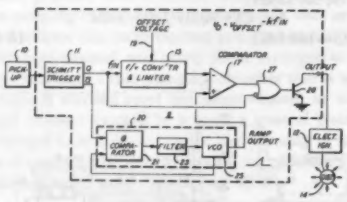
4,164,926
ELECTRONIC IGNITION ADVANCE CIRCUIT

Peter J. Kindlmann, Northford, Conn., assignor to The Echlin Manufacturing Company, Branford, Conn.

Filed Dec. 13, 1976, Ser. No. 749,666

Int. Cl.[2] F02P 1/00

U.S. Cl. 123—148 E **43 Claims**



1. In an internal combustion engine electronic ignition system which includes means for association with the engine having a timing pulse output representing crankshaft position and means for accepting said pulses and generating high voltage energy to be supplied to the spark plugs of the engine in response thereto, an electronic spark advance circuit comprising:

(a) means for developing a voltage proportioned to a desired amount of advance having an input for coupling to the timing pulse output from the engine;

(b) a phase locked loop including a phase comparator, a filter circuit and a voltage controlled oscillator having as inputs to its phase comparator a line adapted to be coupled to said timing pulse output, and the output of said voltage controlled oscillator, the output of said phase comparator coupled through said filter as the input to said voltage controlled oscillator, said phase locked loop thereby acting to adjust the output of said voltage controlled oscillator until the frequency thereof corresponds to the frequency of said timing pulse output, said phase locked loop delivering at its output a ramp voltage which is in phase with the input thereof; and

(c) a comparator having its inputs coupled respectively to the output of said means for developing a voltage proportioned to a desired amount of advance, and the ramp voltage output of said phase locked loop and providing at its output pulses which are advanced with respect to the output pulses of the distributor as a function of said pro-

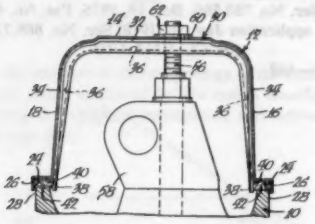
portioned voltage, said output adapted to be coupled as the input to the means for generating high voltage energy.

4,164,927

REINFORCED STAMPED VALVE COVER

Sam R. Congram, Peoria, Ill., and George S. Cole, Laddonia, Mo., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,580
Int. Cl.[2] F01M 9/10
U.S. Cl. 123—195 C 2 Claims



1. A valve cover comprising:

an elongated housing having a trough-like configuration including an elongated base wall, a pair of spaced, elongated side walls attached to and extending from one side of said base wall, and a pair of spaced, relatively short end walls extending from said base wall one side and joining said end walls, said walls being stamped from a single sheet of metal, with the ends of said side and end walls terminating in an outwardly directed ledge having a peripheral flange directed away from said base wall and substantially surrounding said ledge, said flange being generally parallel to said side and end walls;

a pair of spaced, U-shaped strengthening members disposed within said housing, each having a bight and a pair of legs extending therefrom, each said bight being configured to substantially conform to said base wall one side and being in abutment therewith, each said leg abutting a corresponding one of said walls along substantially the entire extension thereof from said base wall and past said ledge to define, with said flange, a gasket receiving pocket opening away from said base wall; and

means securing said strengthening members, in spaced relation, to said housing.

4,164,928

BASKETBALL TOSSING DEVICE

Hurshel Meares, 9877 Grand Teton, Baton Rouge, La. 70814

Filed Nov. 1, 1976, Ser. No. 737,188
Int. Cl.[2] F41B 7/00
U.S. Cl. 124—16 2 Claims

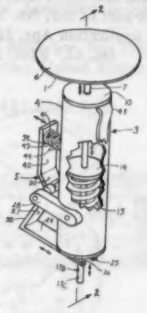
1. A hand held device for tossing a basketball of standard size and shape and specific curvature radius up into the air a predetermined distance which comprises:

(a) a rest plate having a surface on which said basketball can sit, said surface having a curvature radius like said specific curvature radius of said basketball;

(b) a casing structure;

(c) a spring-loaded firing assembly attached to said rest plate and connected to said casing structure; said firing assembly having a firing rod provided with notches at pre-determined positions on said firing rod; and

(d) a firing mechanism assembly having a trigger pivotably attached to said casing structure and having a notched end



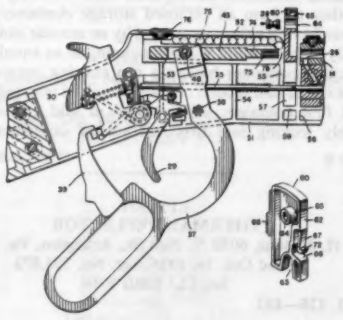
section of sufficient width to fit about said firing rod and into one of said firing rod notches.

4,164,929

PROJECTILE LOADER FOR GUN

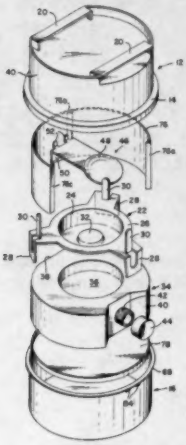
Sigurds Liepins, Rushville, and James W. Crane, Fairport, both of N.Y., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jul. 11, 1977, Ser. No. 814,438
Int. Cl.[2] F41B 11/06; F41F 1/04
U.S. Cl. 124—76 5 Claims



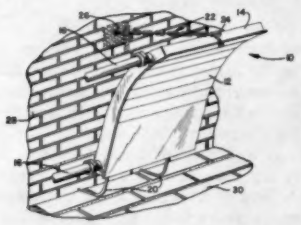
4. In a gun having a frame, a barrel mounted on the frame, and means for discharging a projectile from the barrel, an improved projectile loader slidably mounted in a slot in the frame for sliding movement in a direction transverse to the axis of the barrel, the loader having a bore extending therethrough and being movable between a firing position in which the bore is axially aligned with the barrel and a loading position in which the bore is positioned outside of the frame, the loader being integrally molded from plastic and including a flexible and resilient arm portion which is engageable with a recess in the frame when the loader is in the loading position to restrain removal of the loader from the frame, a portion of the flexible and resilient arm of the loader being positioned outside of the frame when the loader is in its loading position whereby the arm can be pressed out of engagement with the recess to permit the loader to be removed from the frame.

4,164,930
COOKING STOVE
Harold E. Johnston, 8039 43rd Ave. NE., Seattle, Wash. 98115
Continuation-in-part of Ser. No. 740,965, Nov. 11, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 789,940
Int. Cl.[2] F24C *5/20*
U.S. Cl. 126—38 **14 Claims**



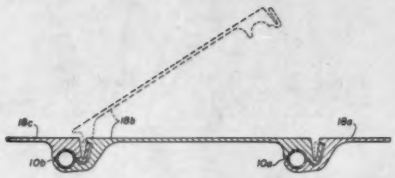
1. A liquid-fuel stove for heating the contents of a pan, comprising a heat-conductive burner plate having a recessed fuel dish adapted to contain a quantity of liquid fuel and a heat-collecting surface adjacent said fuel dish adapted to conduct heat radiated on said surface from said pan to said fuel dish such that heat from said pan vaporizes fuel in said fuel dish, said burner plate being housed within first and second cylinderical containers having their rims releasibly secured to each other to form an enclosed storage container, said first container having a rim surrounded by an annular slot having an inwardly inclined outer wall terminating in an annular groove, said second container having a rim curving outwardly such that the rim of said second container may be inserted in the slot of said first container and retained in said groove thereby releasibly locking said first and second containers to each other.

4,164,931
THERMAL DEFLECTOR
James H. Jenkins, 6010 N. 26th St., Arlington, Va. 22207
Filed Oct. 19, 1976, Ser. No. 733,872
Int. Cl.[2] F24B *9/04*
U.S. Cl. 126—132 **1 Claim**



1. A heat exchange and reflector device for use in a fireplace comprising: a heat exchange chamber having top, bottom, front, back and side panels, said chamber being forwardly curved such that the top panel is horizontally and vertically displaced from the bottom panel, at least one side panel having inlet conduit means and exit conduit means for heat exchange medium to be heated by the fire in the fireplace, a reflector surface attached to and conforming to the shape of the front panel of the heat exchange chamber, a pair of L-shaped legs adjustably connected to the back panel of the heat exchange chamber, hook means attached to the reflector surface and chain means communicating with said hook means for supporting the device in the fireplace.

4,164,932
SOLAR HEAT COLLECTOR CONSTRUCTION
Joseph G. Gavin, Huntington, N.Y., assignor to Grumman Corporation, Bethpage, N.Y.
Division of Ser. No. 750,580, Dec. 15, 1976, Pat. No. 4,086,913. This application Jan. 16, 1978, Ser. No. 869,718
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—448 **1 Claim**



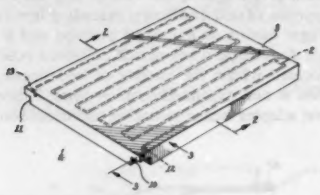
1. A solar collector comprising:
an array of spaced tubes for conducting heat exchange fluid;
means to collect solar energy and transfer its heat to said array of spaced tubes for heating said heat exchange fluid, said means comprising a plurality of finplanks with each finplank of said plurality having a cooperating vertical lip radiating from a downwardly facing first contoured surface at one edge and at another edge a lateral flange inwardly of an upwardly facing second contoured surface, said first contoured surface and said second contoured surface being dimensioned so as to cooperate when about separate portions of a tube of said array of tubes in enclosing said tube, said vertical lip being deformable downwardly and outwardly by said lateral flange on assembly of said another edge to said one edge in joining one finplank edge to another finplank edge to unite a plurality of finplanks said lip engaging said flange such that residual forces tending to return it to its vertical attitude will draw the contoured edges toward each other with the tube interposed in compression as an integral member in joining one finplank edge to another finplank edge to thereby force contact that will provide good thermal conductivity between said array of spaced tubes and said plurality of finplanks.

4,164,933
CONCRETE SOLAR COLLECTORS
Anthony C. Alosi, 5050 Tamarus, Apt. 159, Las Vegas, Nev. 89109
Filed Oct. 6, 1976, Ser. No. 729,963
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—447 **9 Claims**

1. A monolithic precast solar collector roof panel, each said roof panel comprising in combination:
a. reinforcement means contained in said roof panel for increasing the load bearing capability of each said roof panel to withstand the expected roof loads;
b. a fluid conveying passageway formed within said roof panel and defined by the material of said roof panel, said passageway being disposed in proximity to the exterior surface of said roof panel for subjecting the conveyed fluid to the thermal influence of the exterior surface, said passageway having input and output ends;
c. a source of fluid interconnected with the input end of said

passageway for supplying a flow of fluid through said passageway; and

d. heat exchange unit interconnected with the output end of said passageway for receiving a flow of fluid from said passageway;



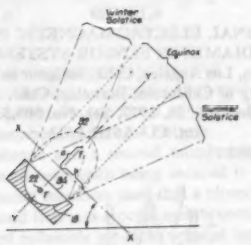
whereby, the increase in thermal energy of the exterior surface of said roof panel irradiated by the sun is transferred to the fluid flowing through said passageway and delivered to said heat exchange unit.

4,164,934

ELLIPTICAL SOLAR REFLECTOR

Robert V. Anderson, 3900 Summercrest Dr., Fort Worth, Tex. 76109

Filed Aug. 16, 1976, Ser. No. 714,497
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—438 **11 Claims**



1. A solar energy collection device, comprising:

an elongated, trough-like elliptical reflector having the concave surface thereof reflectorized and which substantially coincides with a section of a focal end surface of an imaginary elliptical cylinder, said cylinder presenting and being defined in part by a pair of elongated, spaced focal lines;

elongated, solar energy-receiving means adapted to receive and utilize solar energy;

means mounting said solar energy-receiving means in spaced relationship to said concave reflectorized surface and substantially along the elongated focal line of said imaginary elliptical cylinder adjacent said focal end surface for maximum focusing of solar energy from the reflector onto said solar energy-receiving means;

solar energy-conveying cover means disposed over said solar energy-receiving means and the open end of said reflector; and

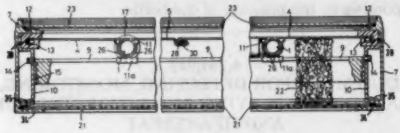
structure supporting said reflector and solar energy-receiving means for passage of at least certain of the sun's rays through or parallel to the remaining focal line of said cylinder and onto said reflectorized surface, in order to reflect and focus said rays onto said solar energy-receiving means.

4,164,935

SOLAR HEATING PANELS

Kevin C. Marles, and Brian W. Spencer, both of Torquay, England, assignors to Solar Apparatus & Equipment Limited, London, England

Filed Sep. 6, 1977, Ser. No. 830,997
Claims priority, application United Kingdom, Oct. 6, 1976, 41506/76
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—447 **5 Claims**



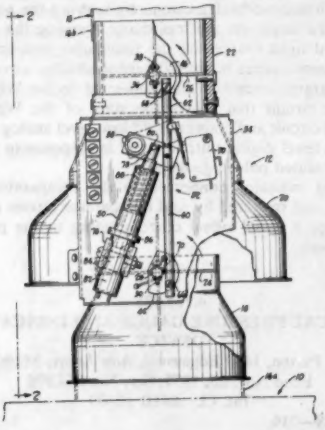
1. A solar heating panel comprising a plurality of cylindrical tubes for carrying a liquid to be heated and an absorber plate for absorbing solar radiation falling thereon, the absorber plate including a plurality of rigid plate sections each having at one edge an outwardly-facing concave substantially semi-cylindrical portion, the concave surface of the semi-cylindrical portion having the same radius of curvature as the outer circumferential surface of one of the cylindrical tubes, and clamping means engaging the convex outer surfaces of the semi-cylindrical portions on two adjacent plate sections and thereby clamping a cylindrical tube with its outer surface in heat-conducting contact with the concave surfaces of said semi-cylindrical portions, each of the plates of said plurality of plate sections being shaped at an opposite edge which is parallel to the said one edge such that the said opposite edge faces towards the said one edge thereby defining a channel in the plate section within which channel a similar opposite edge of another plate section is slidingly engaged in a manner which detachably interlocks the said opposite edges but permits expansion of the plate sections relative to one another.

4,164,936

DAMPER

Nicholas J. Dottore, Jr., 34460 Parkview Dr., Willoughby Hills, Ohio 44094

Filed Aug. 18, 1977, Ser. No. 825,571
Int. Cl.[2] F23N *3/00*
U.S. Cl. 126—285 R **8 Claims**



1. A damper assembly comprising:

a baffle pivotably supported for movement between two positions;

an actuator for pivoting the baffle, said actuator having a heater, an expansible fluid undergoing a fluid to vapor expansion phase change during heating and a vapor to fluid contraction phase change during cooling and a member movable in response to expansion and contraction of said fluid;

a linkage between said movable member and the baffle to pivot the baffle between said two positions in response to movement of said actuator member and

a switch located to be actuated in response to movement of said movable member, so its conductive condition is responsive to the position of the baffle.

4,164,937

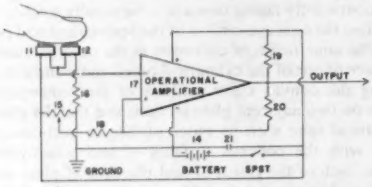
EQUIPMENT FOR DETECTING, MONITORING, MEASURING, DISPLAYING AND RECORDING PULSE AND HEARTBEAT

William E. Spencer, 3201 MacVicar Ct., Topeka, Kans. 66611

Filed Dec. 2, 1976, Ser. No. 748,153

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—666 **3 Claims**



1. Apparatus for detecting, monitoring and displaying the pulse and heartbeat of a human subject consisting of:

a. a transducer for engaging the finger and other parts of the human body to form optically created pulse signals from pulsatile blood volume changes using ambient light sources wherein said transducer consists of two photocells and a potentiometer, means for positioning the photocells to allow the photocells to detect ambient light transmitted through an engaged finger or other body parts and the photocells and potentiometer being connected as arms of a Wheatstone bridge circuit with said photocells being connected in a differential configuration to reduce the effect of changing and unregulated light sources and provide a suitable low level analog signal from minute photocell resistance changes and permit simple adjustments of the Wheatstone bridge circuit by varying the position of subject's finger on the transducer, varying the effect of ambient light sources on the transducer and/or varying the potentiometer in the Wheatstone bridge circuit;

b. comparator circuit means connected to the Wheatstone bridge circuit that senses the state of the Wheatstone bridge circuit and converts said low level analog signal to a high level digital output signal in response to the optically created pulse signals; and

c. a light indicator connected to the comparator circuit means and operated by said comparator circuit means to produce a visual signal corresponding to the pulse and heartbeat.

4,164,938

MEDICAL PRESSURE GAUGE AND INDICATOR DEVICE

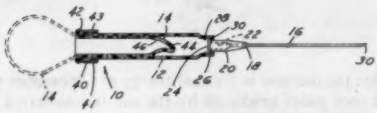
William F. Patton, 1400 Edgewood, Ann Arbor, Mich. 48103

Filed Nov. 25, 1977, Ser. No. 854,870

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—716 **7 Claims**

1. A medical pressure gauge and indicator device for diagnosing the presence of tension pneumothorax in the pleural cavity of a patient comprising a diaphragm having an interior surface for contact with the pressure of air within the pleural cavity and having an exterior surface for contact with atmospheric air: a needle of sufficient length for puncturing the chest wall and for extending into the pleural cavity; an elongated rigid tubular sleeve having a pair of ends and mounting said needle and said diaphragm; means for fixedly securing a portion of said diaphragm to one end of said sleeve, with the remaining portion of said diaphragm extending into said sleeve; said diaphragm having an expanded position and a collapsed position; said diaphragm when in said collapsed position being generally located within the interior of said sleeve; said diaphragm when in said expanded position being located outside of said sleeve; adapter means mounting said needle on the other



end of said sleeve; said needle having a rear end inflow communication with the interior of said sleeve and the interior surface of said diaphragm and a sharpened chest wall-puncturing forward end; said needle being adapted to transmit the pressure of air within the pleural cavity to the interior of said sleeve where it acts upon the interior surface of said diaphragm, said diaphragm forming pressure means whereby, if a pressure greater than atmospheric pressure is present, the diaphragm will be urged out of said sleeve to said expanded position and will form a balloon-like shape which positively indicates the presence of greater than atmospheric air within the pleural cavity, thus indicating the treatment required for the patient.

4,164,939

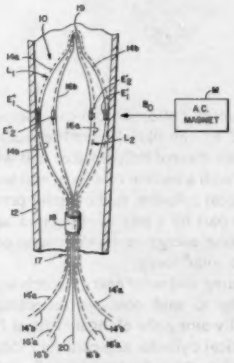
ORTHOGONAL ELECTROMAGNETIC FLOW AND DIAMETER SENSOR SYSTEM

Alexander Kolin, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 24, 1977, Ser. No. 809,539

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—692 **13 Claims**



1. An intravascular loop probe comprising:

a first flat deformable wire loop disposed in a first plane;

a second flat deformable wire loop disposed in a second plane substantially perpendicular to and centrally intersecting said first plane, said first and second loops defining said probe, each of said loops being closed at one end and having terminals at the other end, said loops being collapsible to an elongated narrow configuration for insertion into a narrow conduit and expansible in a larger conduit; and

electrode means formed at a diametrically opposite sides of each of said loops for picking up electromagnetically induced signals corresponding to rate of fluid flow in said larger conduit and said loop terminals being connected to said electrode means for yielding an induced signal corresponding to the width of said larger conduit, whereby an externally applied magnetic field will cause induction of voltages in said flowing fluid and said loops in said larger conduit, said voltages corresponding to the rate of fluid flow in said larger conduit, and to the diameter of said larger conduit.

4,164,940

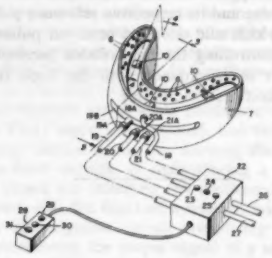
DENTAL CLEANING AND MASSAGING APPARATUS

James D. Quinby, 1092 NE. Glass Dr., Jensen Beach, Fla. 33457

Filed Dec. 30, 1977, Ser. No. 865,867

Int. Cl.[2] A61H *7/00*

U.S. Cl. 128—62 A **15 Claims**



1. Dental hygiene apparatus comprising:

a mouthpiece having a generally U-shaped upper channel member open at the top and a generally U-shaped lower channel member open at the bottom;

a first membrane and a second membrane, said first and second membranes each being secured to said upper and lower channel members such that a closed area is formed between said first and second membranes;

a plurality of inflatable air-sacks located inside said closed area, adjacent to the bottom surface of said upper channel member and adjacent the upper surface of said lower channel member such that said plurality of air-sacks are located between said upper and lower channel members;

a first plurality of bite blocks located in said upper channel member, said first plurality of bite blocks being spaced apart in said upper channel member;

a second plurality of bite blocks equal in number to said first plurality of bite blocks, said second plurality of bite blocks being so located in said lower channel member such that each one of said second plurality of bite blocks is located directly opposite a different one of said first plurality of bite blocks;

a plurality of connecting posts equal in number to the number of said first and second plurality of bite blocks, one end of each of said connecting posts being secured to a different one of said first plurality of bite blocks and the other end of each one of said plurality of connecting posts being secured to a different one of said second plurality of bite blocks; and

means for periodically inflating said plurality of air-sacks such that said plurality of air-sacks are alternately inflated and deflated to cause said upper and lower channel members to alternately move away from and toward each other.

4,164,941

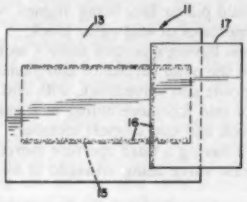
DISPOSABLE DRAPE FOR SURGICAL TABLE

Robert A. Knopick, Downers Grove, and Allen B. Morlock, Naperville, both of Ill., assignors to Steraplast, Inc., Bensenville, Ill.

Filed Nov. 18, 1977, Ser. No. 852,692

Int. Cl.[2] A61B *19/06*

U.S. Cl. 128—132 D **1 Claim**



1. A disposable drape for covering a surgical table and providing drape coverage extending from the table to an operating surface, said drape comprising a compact package for transporting and handling thereof, said drape comprising a non-fenestrated base sheet adapted to lie directly over said table surface, a fluid impervious plastic film of smaller size than said base sheet bonded onto one surface of said base sheet and in a central portion of the base sheet for preventing fluid flow from penetrating said drape and coming into contact with the table surface, an extension sheet bonded along one edge of the said base sheet, said extension sheet overlapping at least approximately half its width over an end of said base sheet whereby a continuous and unbroken drape coverage is provided along the table to an operating surface, said extension sheet folded in a fan fold onto said base sheet and said base sheet folded into two fan fold groups from opposite edges of the sheet, one of said base sheet fan folds overlapping portion of the extension sheet fold, said one folded group then folded onto the second folded group to provide said compact package, whereby said fan fold groups are unfoldable from said compact package for first spreading the base sheet and subsequently unfolding said extension sheet.

4,164,942

FACE MASK AND FACEPIECE THEREFOR

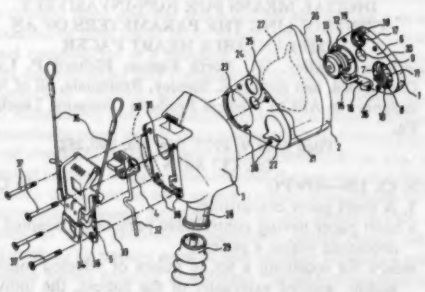
Michael A. Beard, Moseley, and Edward A. Williams, Warwick, both of England, assignors to DCA Design Consultants Limited, Warwick, England

Filed Sep. 20, 1977, Ser. No. 835,007

Claims priority, application United Kingdom, Sep. 21, 1976, 39043/76

Int. Cl.[2] A62B *7/14*

U.S. Cl. 128—146.5 **5 Claims**



1. A face mask comprising:

a substantially planar valve block having first and second apertures therethrough;

an inspiratory valve arranged in said first aperture;

an expiratory valve arranged in said second aperture;

a substantially flexible molded facepiece having a substantially planar face of substantially constant thickness, said planar face having two apertures therethrough;

said planar valve block being secured adjacent an inner surface of said planar face of said facepiece with said two apertures of said planar face being aligned with said first and second apertures of said valve block;

a support member having a portion thereof secured substantially adjacent the outer surface of said planar face of said facepiece opposite said valve block, with said substantially planar face of said facepiece acting as a gasket between said valve block and said support member;

said valve block having a third aperture therethrough;

an anti-suffocation valve being arranged in said third aperture; and

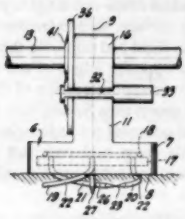
said substantially planar face having a third aperture therethrough aligned with said third aperture of said valve block.

4,164,943

CATHETER ANCHOR

J. Donald Hill, San Francisco, and Gordon H. Fountain, Oakland, both of Calif., assignors to Thoratec Laboratories Corporation, Emeryville, Calif.

Filed Sep. 30, 1977, Ser. No. 838,320
Int. Cl.[2] A61M *25/02*
U.S. Cl. 128—348 **7 Claims**



1. A catheter anchor comprising a base having a portion adapted to extend substantially parallel to subjacent skin, means including a plurality of needles fixed on said base and extending from said parallel portion in paths similarly helical with respect to said parallel portion for substantially simultaneously piercing and interengaging with said skin upon rotation of said base relative to said skin, and means on said base for holding a catheter.

4,164,944

DIGITAL MEANS FOR NON-INVASIVELY CONTROLLING THE PARAMETERS OF AN IMPLANTABLE HEART PACER

Lawrence E. Alley, III, North Easton; Richard P. Lydick, Chelmsford, and Robert E. Stanley, Roslindale, all of Mass., assignors to ARCO Medical Products Company, Leechburg, Pa.

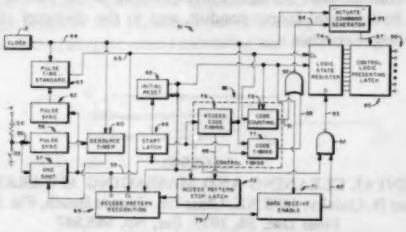
Filed May 9, 1977, Ser. No. 795,252
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **15 Claims**

1. A heart pacer comprising:

a heart pacer having controllable parameters adapted to be implanted within a patient,

means for receiving a set of pulses of selected individual widths, applied externally of the patient, the individual widths of each of the received pulses representing a binary logic state of zero or one, the binary logic states of said set of pulses representing a corresponding set of controllable parameters,

means for decoding the received pulses in accordance with the individual width of each of the received pulses including, a reference pulse generator for producing a series of pulses each in timed relation to a respective one of said received magnetic pulses, and pulse comparison means



operative to detect each received pulse as a zero or one in dependence upon the time of coincidence between the received pulse and its respective reference pulse, and

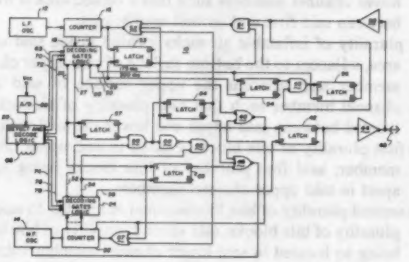
means into which said decoded received pulses are registered for controlling the controllable parameters of said heart pacer in accordance with the logic states represented by said received pulses.

4,164,945

DIGITAL CARDIAC PACEMAKER MEDICAL DEVICE

Jerome T. Hartlaub, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 13, 1977, Ser. No. 805,726
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **51 Claims**



1. A digitally controlled medical device capable of providing output pulses of a certain duration at a determined rate, said device comprising:

a first oscillator for providing a first timing signal at a first periodic rate;

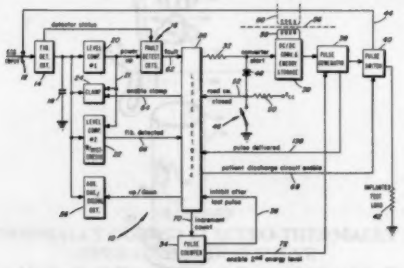
a second oscillator for providing a second timing signal at a second periodic rate; and

control means responsive to said first timing signal for controlling said predetermined rate and for enabling said second oscillator to provide said second timing signal and responsive to said second timing signal for controlling said certain duration and for disabling said second oscillator from providing said second timing signal at times other than said certain time.

4,164,946
FAULT DETECTION CIRCUIT FOR PERMANENTLY IMPLANTED CARDIOVERTER

Alois A. Langer, Pittsburgh, Pa., assignor to Mieczyslaw Mirowski, Owing Mills, Md.

Filed May 27, 1977, Ser. No. 801,300
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 D **13 Claims**

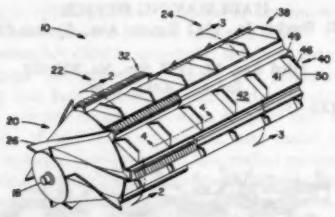


1. A discrete fully implantable interrogation circuit for use with a fully implantable cardioverter having a discrete fibrillation detector circuit made up of a plurality of components, each of which produces a characteristic output signal when said fibrillation detector circuit is functioning properly, said detector circuit serving to monitor an ECG signal and to issue a fibrillation detected signal when predetermined characteristics of said ECG signal are detected, and further having an energy storage device, means for charging the energy storage device to a level capable of defibrillating a malfunctioning heart, and means for initiating the discharge of the energy storage device into the heart of a wearer, said discrete fully implantable interrogation circuit comprising: fault detector means for monitoring the output signal of a select number of said components to determine whether said output signal is not within prescribed limits so as to cause said fibrillation detector circuit to misinterpret said ECG signal; and disabling means associated with said fault detector means for inhibiting the discharge of said storage device into the heart of the wearer in the event that said fault detector means senses a malfunction in said fibrillation detector circuit by recognizing an output signal not within said prescribed limits.

4,164,947
ROTOR FOR AN AXIAL FLOW ROTARY SEPARATOR

John E. Wilson, Colona, Ill., assignor to Deere & Company, Moline, Ill.

Filed Mar. 10, 1978, Ser. No. 885,305
Int. Cl.² A01F *12/20*
U.S. Cl. 130—27 HA **14 Claims**



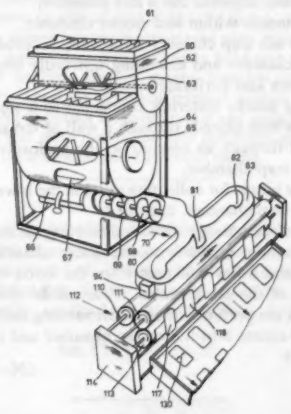
1. In an axial flow rotary separator for processing crop material, including a housing having walls, said walls including a foraminous portion and an inlet for receiving crop material and an outlet axially spaced downstream from the inlet, and a rotor mounted for rotation in the housing and disposed so as to create in cooperation with the housing an annular space extending between the inlet and the outlet, said rotor having a frame and an upstream threshing portion and a downstream separating portion, said threshing portion having at least two circumferentially spaced threshing bars carried by the frame, each bar including a plurality of axially spaced raised ribs and said separating section having at least two circumferentially spaced separating bars carried by the frame, the improvement in the rotor comprising:

a plurality of axially spaced material mover blades carried by the frame circumferentially spaced from the threshing bars, each blade being of substantially greater radial extent than the threshing bar ribs and having a working surface and being disposed substantially athwart the direction of rotation and said working surface having with respect to the direction of rotation a leading portion and a trailing portion, said leading portion being disposed upstream of the trailing portion and the axial spacing of the blades being substantially greater than the axial spacing of the threshing bar ribs so that crop material in the annular space engaged by the working surface is deflected downstream.

4,164,948
METHOD FOR MAKING ARTIFICIAL TOBACCO AND APPARATUS FOR PERFORMING SAID METHOD

Monique Beringer, Saint Louis, France, and Heinz Sporri, Zurich, Switzerland, assignors to Tamag Basel AG, Birsfelden, Switzerland

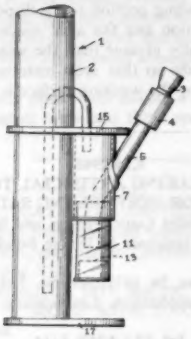
Filed Jan. 24, 1977, Ser. No. 762,129
Claims priority, application Luxembourg, Jan. 23, 1976, 74233
Int. Cl.² A24B *3/14*
U.S. Cl. 131—140 C **12 Claims**



1. A method for making artificial tobacco comprising forming a substantially homogenous moist composition containing finely divided plant material and additives and having a moisture content of from about 20 to 50 percent by weight, kneading said composition at a pressure of about 50 to 150 atmospheres and extruding said composition through a die to form a substantially uniform strand, continuously dividing said strand immediately after formation thereof into strand sections of substantially equal length, the amount of finely divided plant material contained in said moist composition and the size of said strand sections being so selected that the amount of artificial tobacco contained in each strand section corresponds to a predetermined quantity of about 0.1 to 2.0 grams within a tolerance of ±10 percent, immediately rolling down said strand sections by passing each of said sections between a pair of squeeze rollers rotating at different circumferential speeds and being urged out of mutual linear engagement of their circumferential surfaces by the strand section entering therebe-

tween to thereby form a narrow nip of predetermined width, to thereby form individual rolled down artificial tobacco strips having a surface area of from about 8 to 100 sq. cm.

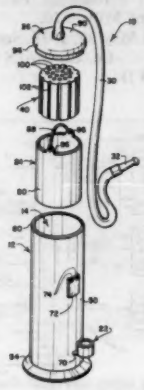
4,164,949
ASH TRAP FOR A BONG
Jeffrey K. Diven, Wheaton, Md., assignor to McCall Associates, Inc., Rockville, Md.
Filed Jan. 25, 1978, Ser. No. 872,260
Int. Cl.[2] A24F *1/30*
U.S. Cl. 131—173 **5 Claims**



1. In a bong having a water chamber, the combination of a smoke chamber adjacent the water chamber,
perforate means within said smoke chamber,
a separate ash trap chamber removably secured below said smoke chamber and extending upwardly into it in abutment with said perforate means,
a bowl for smoke materials connected to a smoke passage means which extends through a wall of the smoke chamber and through an opening in the perforate means into the ash trap chamber,
removable means for collecting ashes in the lower portion of the ash trap chamber, and
seconds smoke passage means connecting an upper portion of the smoke chamber to the water chamber whereby smoke and ashes will pass from the bowl to the lower portion of the ash chamber while smoke alone will pass through the perforate means surrounding said first smoke passage means into the smoke chamber and to the water chamber.

4,164,950
SMOKING APPLIANCE
Joseph A. Bechtold, 1048 Homestead Rd., South Euclid, Ohio 44121
Filed Jan. 3, 1978, Ser. No. 866,790
Int. Cl.[2] A24F *1/22*
U.S. Cl. 131—194 **13 Claims**

1. A smoking appliance comprising:
(a) housing means including structure defining a cooling chamber;
(b) smoke introduction means for introducing smoke into the cooling chamber at a first location therein;
(c) smoke withdrawal means for withdrawing smoke from the cooling chamber at a second location spaced from the first location; and,
(d) solid-phase cooling medium means including a sealed, reusable, freezable cartridge for positioning in the cooling chamber and for defining a plurality of flow paths therethrough for the travel of smoke as smoke moves from the



first location to the second location during use of the appliance.

4,164,951
HAIR CURLER SYSTEM
Amos J. Shaler, 705 W. Park Ave., State College, Pa. 16801, and Daniel C. McLean, 4029 Alicante, Fort Worth, Tex. 76133
Filed Nov. 8, 1976, Ser. No. 739,925
Int. Cl.[2] A45D *2/00*
U.S. Cl. 132—31 R **23 Claims**

1. A hair treating device adapted to receive a hank of hair, said device comprising a tubular body of desiccant and a heat storage core disposed within the tubular body, said heat storage core having a bulk density greater than that of the tubular body.

4,164,952
HAIR WAVING DEVICE
Edward D. Banks, Jr., 1312 Kansas Ave., Kansas City, Kans. 66105
Filed Aug. 18, 1977, Ser. No. 825,653
Int. Cl.[2] A45D *2/24*
U.S. Cl. 132—37 R **4 Claims**

1. A hair waving device comprising:
a. a pair of plates similarly corrugated in rounded wave form to receive a lock of hair therebetween transversely to the corrugations thereof to impart a longitudinally sinuous form to said lock of hair, and

b. latch means operable to secure said plates releasably together whereby to clamp said lock of hair therebetween, said latch means being adjustable to clamp said plates together when the general planes of said plates are disposed in variably non-planar relation, either longitudinally or transversely of the corrugations thereof.

4,164,953

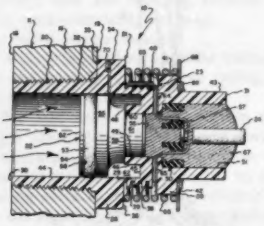
NORMALLY-CLOSED ELECTRO-THERMALLY OPERATED FLOOD VALVE

Carlton W. Naab, Williamsville, and Roman Jankowiak, Cheektowaga, both of N.Y., assignors to Conax Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 750,241, Dec. 13, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 849,973

Int. Cl.[2] F16K *13/04, 13/06, 17/40, 51/00*

U.S. Cl. 137—72 **7 Claims**



1. A flood valve adapted to be mounted in an opening provided through a wall, said wall separating a pressurized fluid on one side thereof from an unpressurized space on the other side thereof, said flood valve comprising:

a body member adapted to normally close said opening to sealingly separate said pressurized fluid from said unpressurized space, said body member having a forward portion adapted to be sealingly mounted in said opening and having a rearward portion arranged in said unpressurized space, said forward and rearward portions being joined by an intermediate thin-walled section, said forward portion having a cylindrical bore adapted to communicate one side of said rearward portion with said fluid;

a piston assembly slidably mounted in said bore and arranged to engage said rearward portion, said piston assembly having one face exposed to said fluid and arranged to define a sealed chamber between its other face and said one side of said rearward portion, said sealed chamber being arranged proximate said thin-walled section; and

an electrical heating element surrounding said thin-walled section and adapted to be selectively energized to melt said thin-walled section to permit said rearward portion to separate from said forward portion;

whereby said flood valve may normally close said opening, and may be selectively operated to melt said thin-walled section to permit the pressure of said fluid to displace said piston assembly and rearward portion away from said forward portion and to permit fluid to enter said unpressurized space through the bore of said forward portion.

4,164,954

FLUID PRESSURE CONTROL MECHANISM

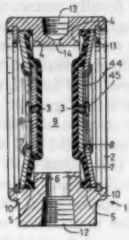
Allan Ballard, 1552 Balena Ave., Ottawa, Ontario, Canada (K1G 0X3)

Continuation-in-part of Ser. No. 552,736, Feb. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 330,020, Jun. 2, 1973, Pat. No. 3,867,963. This application Nov. 26, 1976, Ser. No. 744,962

The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.

Int. Cl.[2] G05D *16/00;* **F15D** *1/02;* **F17D** *1/20*

U.S. Cl. 137—115 **9 Claims**



1. A resilient wall structure for use in a pulsating fluid pressure control device comprising:

at least one frusto-conical apertured Belleville spring,

a plate means disposed in aperture covering load supporting relation against inner portions of the convex side of said Belleville spring,

a resilient washer means in engagement with inner portions of the concave side of said Belleville spring, and

connecting means interconnecting said plate means and said resilient washer means to resiliently hold said plate means and said resilient washer means together in generally concentric aperture covering relation against said Belleville spring to permit relative pivotal and radial movement between said plate means and said Belleville spring means on axial deflexion of said Belleville spring.

4,164,955

LIQUID LEVEL CONTROL VALVE

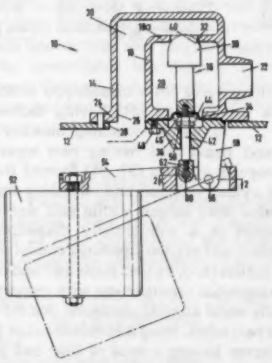
Ronald N. Allen, Sevenoaks, England, assignor to Millars Wellpoint International Ltd., Bishops Stortford, England

Filed Oct. 18, 1977, Ser. No. 843,329

Claims priority, application United Kingdom, Oct. 20, 1976, 43496/76

Int. Cl.[2] F16K *31/26*

U.S. Cl. 137—202 **6 Claims**



1. A liquid level control valve, utilized in combination with

air separation means and positioned between said air separation means and a vacuum source for preventing the passage of liquid from said air separation means to said vacuum source, comprising:

casing means for mounting upon said air separation means,

a suction chamber formed in said casing means,

a source of vacuum communicating with said suction chamber,

a port, formed in the wall of said chamber, adapted to be opened and closed by means of a valve member, and providing fluidic communication between said air separation means and said suction chamber,

a flexible member fixedly connected to said valve member and sealingly engaged around its periphery with an aperture defined in a wall of said chamber so as to facilitate the definition of a flexible wall portion of said member, the effective surface area of said flexible wall portion of said flexible member being greater than the cross-sectional area of said port so as to bias said flexible wall portion of said flexible member, and said valve member connected thereto, toward said closed port position, and

a liquid level controlled float connected to said valve member for effecting opening and closing movements thereof in response to the liquid level within said air separation means so as to permit the withdrawal of air from said air separation means to said vacuum source when said valve member is opened, and to prevent the passage of liquid from said air separation means to said vacuum source when said valve member is closed.

4,164,956
SWITCHING VALVES

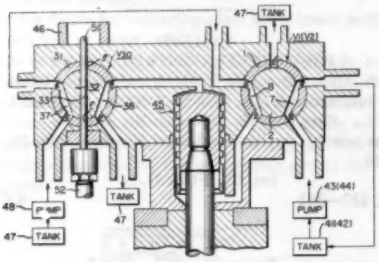
Akio Takahashi, Yokohama, and Hirokichi Saito, Shimizu, both of Japan, assignors to Ihara Chemical Industry Co. Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,932

Claims priority, application Japan, Feb. 20, 1976, 51/16922; Apr. 19, 1976, 51/48952; Aug. 5, 1976, 51/104062

Int. Cl.[2] F16K *11/07, 11/085*

U.S. Cl. 137—242 **1 Claim**



1. A switching valve for a closed-type molding apparatus, comprising a valve sleeve (31) having therein five regular openings (a . . . e), and a switching member (32) rotatable relative to said sleeve and having two separate, non-communicating regular grooves (37, 38) formed therein; wherein said sleeve is cylindrical, and said switching member is in the form of a valve stem lodged within said sleeve and has said regular grooves in a substantially diametral arrangement therein; wherein said regular openings consist of two inlets (a, c) and three outlets (b, d, e), said inlets and said outlets alternating in their sequential arrangement with respect to said sleeve at substantially equal angular distances; one (b) of said outlets, between said two inlets, being a common outlet for those inlets; said two grooves having a total of four end ports for selectively making connection between pairs of adjacent ones of said regular openings, namely between an inlet and an outlet; and wherein said sleeve has therein an additional opening (f) diametrally aligned with another one (e) of said regular openings, and further wherein said switching member has therein an additional groove (33) that is capable of linking said additional opening to said other opening; and a knock-out rod (51) removably insertable into said additional groove, for removing solidified material from the valve.

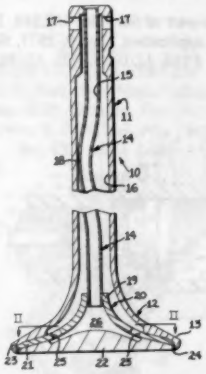
4,164,957
OIL-COOLED ENGINE VALVE

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 23, 1977, Ser. No. 854,190

Int. Cl.[2] F01P *3/14;* **F16K** *49/00;* **F01L** *3/18*

U.S. Cl. 137—340 **11 Claims**



1. A valve comprising

an elongated hollow stem,

a head secured to an end of said stem and defining an annular valve face thereon,

circulating means in said valve for circulating a coolant therethrough, said circulating means comprising a tube disposed in said stem to terminate at said head and secured between said stem and said head to define a first passage means in said tube and a second passage means between said stem and said tube,

heat conduction means secured in said head and disposed in close proximity to said face for conducting heat away from said face and to said coolant, said conduction means comprises an annular member composed of a material having a thermal conductivity substantially higher than the material composing said stem and said head and secured in said head to substantially separate said first and second passage means from each other and wherein radial portions of said member are disposed in close proximity to the valve face formed on said head for conducting heat therefrom, said circulating means further comprising port means formed through said member for communicating said first and second passage means with each other, and

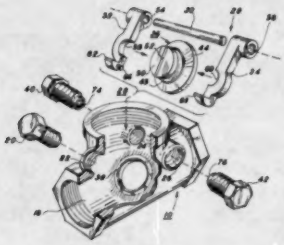
an annular separate cap secured on an end of said head and wherein the radial portions of said member are secured in sandwiched relationship between said cap and an annular portion of said head having said valve face defined thereon.

4,164,958

SWING CHECK VALVE

John J. Jaconette, Shelton, Conn., assignor to Jenkins Brothers, Bridgeport, Conn.

Filed Nov. 3, 1977, Ser. No. 848,113
Int. Cl.[2] F16K *15/03*
U.S. Cl. 137—527 9 Claims



1. A swing-type check valve comprising:

a. a hollow valve casing, defining an inlet port and an outlet port, and incorporating a transverse internal partition having an aperture encircled by a valve seat facing the outlet port;

b. two juxtaposed hanger members, each independently pivotally mounted inside the valve casing on substantially coaxial pivot axes and defining between themselves a valve disc neck-embracing opening,

c. a unitary valve clapper having:

(1) a valve disc disposed between the inlet and outlet ports within the interior of the valve casing, cooperatively juxtaposed to the valve seat, and

(2) a valve disc neck protruding from the valve disc, having a reduced hanger-engaging portion, shaped to interfit between and be embraced by the two juxtaposed pivoted hanger members, bounded by facing, hanger-embracing surfaces minimizing relative movement between the assembled valve clapper and the juxtaposed pivoted hanger members,

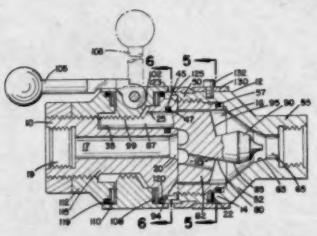
whereby the valve clapper is carried by the two juxtaposed pivoted hanger members, pivotally responsive to check and block any return flow of fluid through the valve.

4,164,959

METERING VALVE

Paul D. Wurzburger, deceased, late of Cleveland Heights, Ohio, and by Peter Reed, executor, Cleveland, Ohio, assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Apr. 15, 1977, Ser. No. 787,906
Int. Cl.[2] F16K *31/53*
U.S. Cl. 137—553 23 Claims



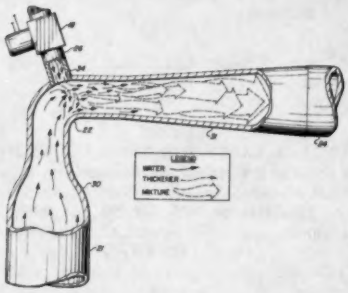
1. An axial flow metering valve comprising a valve body having an inlet, an outlet and a valve chamber between said inlet and outlet, said valve body including first and second body parts, said first body part having a passage for fluid between said inlet and said valve chamber and at least two axially extending guide slots spaced radially from said fluid passage, a valve seat in said valve chamber, said valve seat being formed in said second body part, a valve member in said valve chamber movable toward and away from said valve seat, said valve member having a body portion with at least two guide pins extending axially from said body portion through said guide slots, the number of said guide pins corresponding to the number of said guide slots, each guide pin having a continuing segment of an encompassing thread, and an actuating member surrounding and threadedly engaging said guide pins, whereby said actuating member while being axially restrained is rotatable to move said valve member toward and away from said valve seat.

4,164,960

APPARATUS FOR MIXING FLUIDS

Charles W. Howard, San Dimas, Calif., assignor to Early California Industries Inc., Phoenix, Ariz.

Filed Feb. 13, 1978, Ser. No. 877,335
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—604 1 Claim



1. A mixing system for intermittently mixing water with a relatively much more viscous liquid polymer thickening agent, to form a fire extinguishing and retarding composition of variable viscosity, said system including:

(a) a reservoir for said polymer liquid;

(b) a mixing conduit including an elbow section having an aperture formed in the wall of the outer radius thereof;

(c) means for delivering water under pressure to said mixing conduit upstream of said elbow section;

(d) means for injecting said polymer liquid under pressure through the aperture in said elbow section, such that said liquid exits said aperture at the inner surface of the outer radius of said elbow section and in a direction substantially perpendicular to said inner wall, to mix said polymer with said water under high hydraulic shear conditions; and

(e) valve means intermediate said polymer reservoir and said aperture for controllably interrupting the injection of liquid polymer through said aperture and for preventing flow of water into said polymer reservoir when said polymer injection is interrupted.

4,164,961

FLUIDIC PRESSURE/FLOW REGULATOR

Tadeusz M. Drzewiecki, Silver Spring, and Francis M. Manion, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

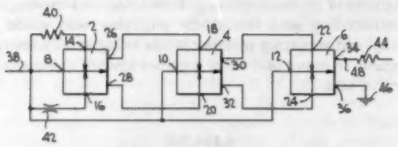
Filed Jul. 28, 1977, Ser. No. 819,786
Int. Cl.[2] F15C *1/14*
U.S. Cl. 137—823 7 Claims

1. A fluidic flow regulator comprising:

a fluid inlet for connection to a source of unregulated fluid;

power jet means comprising a plurality of channels commu-

nicating with said fluid inlet, said channels being oriented to issue streams of fluid that converge to form a jet of fluid, the flow resistance of the first of said channels having a generally linear flow rate versus pressure drop characteristic and the flow resistance of the second of said channels having a flow rate that varies approximately as the square root of the pressure drop, to provide a jet of



fluid whose direction varies solely as a function of the pressure of said unregulated fluid; and

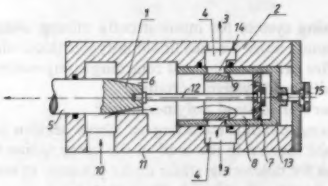
output means to divide said jet of fluid into a discharge stream and a regulated stream, said output means being positioned to increase the proportion of said jet of fluid going to said discharge stream as the presssure of said jet of fluid increases.

4,164,962

CONTROL VALVE FOR PARALLEL FLOWS

Nils-Eirk Soderberg, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Oct. 19, 1977, Ser. No. 843,380
Claims priority, application Sweden, Oct. 20, 1976, 7611621
Int. Cl.[2] F16K *11/07*
U.S. Cl. 137—862 **7 Claims**



1. Control valve for connecting a plurality of fluid demand locations having a total area to a common feed device, comprising

(a) a valve housing;

(b) a main regulating valve for the total flow to said demand locations;

(c) a second valve coupled to said main regulating valve and comprising a plurality of valve means corresponding to the respective said demand locations;

(d) each of said main regulating valve and said second valve being associated with slotted openings of such shape that opening of said control valve produces a steady increase in a well-defined opening area;

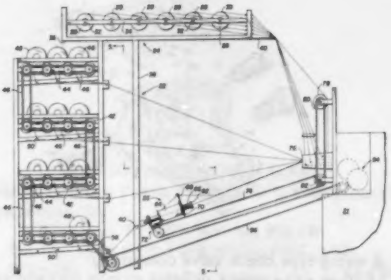
(e) said main regulating valve and said second valve being so coupled together that, at a first degree of opening of said control valve, the total throughflow areas of the respective valves are equal; at a second degree of opening less than said first degree, the throughflow area of said main regulating valve exceeds that of said second valve; and at a third degree of opening greater than said first degree, the throughflow area of said second valve exceeds that of said main regulating valve.

4,164,963

APPARATUS FOR FORMING A NARROW WEAVE FROM BARE ELASTOMERIC THREADS

Thomas C. Black, Middletown, Canada, assignor to J. F. Stevens & Co., Inc., New York, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,457
Int. Cl.[2] D03D *41/00, 49/06*
U.S. Cl. 139—11 **9 Claims**



1. A loom comprising:

a weaving means having a drive means;

a first plurality of elements supplying individual elastomeric warp threads;

a means for supplying a plurality of non-elastomeric warp threads separating said elastomeric warp threads with the edge warp threads of the total warp being an elastomeric thread;

first control means interconnected to said drive means for engaging said first supply elements and letting off all of said elastomeric warp threads in synchronization with each other and with the operation of said loom to provide uniform tension;

a pair of wrapping means, one for each elastomeric edge warp thread, for wrapping yarn loosely around said elastomeric edge warp threads without modifying the diameter of the elastomeric edge warp threads; and

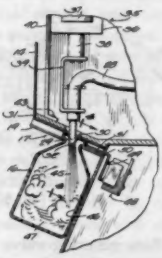
second control means interconnecting said drive means and said pair of wrapping means for synchronous operations.

4,164,964

FLUID DISPENSER FOR RECONSTITUTING BEVERAGES AND THE LIKE

Paul J. Daniels, Sarasota, Fla., assignor to Shirley D. Alderman, Signal Mountain, Tenn. and Joyce D. Hendrix, South Wilmette, Ill., part interest to each

Filed Oct. 31, 1977, Ser. No. 847,181
Int. Cl.[2] B65B *3/34*
U.S. Cl. 141—329 **28 Claims**



1. Apparatus for dispensing fluid into a material in a container for mixing with the contents thereof, comprising:

a valve having input means for pressurized fluid and having output means,

means comprising a punch and a nozzle, said nozzle having input means and having output means for projecting a stream of fluid in a predetermined path,

flexible tubular means for coupling the output means of said valve with the input means of said nozzle,

first means for advancing and retracting said punch and nozzle relative to a container,

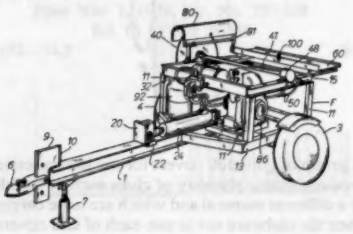
holder means for holding a container in a position for being entered by said punch and nozzle output means when said nozzle is advanced, said holder means comprising elements disposed on opposite sides of the line of travel of said punch and nozzle for receiving and engaging a part of said container between them and for holding said container at an angle relative to said predetermined path of said fluid for projected fluid to deflect from an inner surface of said container in the direction of another inner surface thereof to thereby produce a turbulent circulating motion in said fluid for enhancing mixing with the contents of the container.

4,164,965

COMBINATION LOG SAW AND SPLITTER MACHINE

Ronald A. Bodart, Oconto Falls, Wis., assignor to Little Gem Manufacturing, Inc., Oconto Falls, Wis.

Filed Jun. 1, 1978, Ser. No. 911,352
Int. Cl.[2] B27L *7/00*
U.S. Cl. 144—3 K **7 Claims**



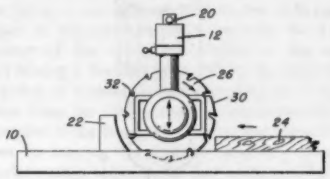
1. A combination log saw and splitter machine comprising: a mobile frame, a circular saw blade having a drive shaft rotatably mounted on said frame, a hydraulic motor connected to said drive shaft for rotatably driving said saw blade, fluid control means for said hydraulic motor, a log holding table slideably mounted on said frame for sliding movement thereon from a log loading position to a log cutting position whereby a log on said table and extending outwardly at one side of said frame is cut by said circular saw, a blade guard positioned over said blade and connected to said table for sliding movement therewith, and means for detachably securing said guard to said table and said frame, whereby said guard can be removed and mounted on said frame in a flat, storage position; a log splitting knife secured to said frame at a forward end thereof, a double acting hydraulic cylinder mounted on said frame, a pusher block slideably mounted on said frame and connected to and driven by said hydraulic cylinder for being urged toward and away from said knife whereby a log inserted between said pusher and said knife can be split by extension of said hydraulic cylinder, an internal combustion engine mounted on said frame, a hydraulic pump mounted on said frame and driven by said engine, another fluid control means for said hydraulic cylinder, both of said fluid control means separately connected to said hydraulic pump for receiving pressured fluid therefrom.

4,164,966

METHOD AND APPARATUS FOR SELF-FEEDING AND SAWING WOODEN WORKPIECES

Charles H. Mason, 748 Rosewood, Nacogdoches, Tex. 75961

Continuation-in-part of Ser. No. 773,916, Mar. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 543,964, Jan. 24, 1975, abandoned. This application Mar. 24, 1978, Ser. No. 889,935
Int. Cl.[2] B27B *5/02*
U.S. Cl. 144—312 **3 Claims**



1. The method of sawing wooden workpieces of varying thickness, degree of hardness and differing grain pattern positioned on a support surface comprising the steps of:

(a) positioning a circular safety-back toothed saw blade for rotation on an axis above said workpiece and said support surface, said blade including an advancing segment and a retreating segment, said advancing segment constituting that portion of said blade, the periphery of which is moving downwardly with respect to said support when said blade is rotating, and said retreating segment constituting that portion of said blade which is moving upwardly with respect to said support when said blade is rotated;

(b) rotating said blade relative to said support and said workpiece at a speed sufficient to saw said workpiece and wherein said teeth on said advancing segment simultaneously generate and apply to said workpiece a sufficient combination of horizontal and vertical thrust to selectively move said workpiece and said saw one with respect to the other at a rate compatible with the ability of said saw to simultaneously cut and feed said workpiece and said saw one with respect to the other;

(c) adjusting the position of said blade, said support and said workpiece relative to each other during initial contact between said blade and said workpiece and continuing the adjustment until a relative position is reached between positions of blade generated maximum vertical thrust and minimum horizontal thrust on the workpiece on the one hand and blade generated minimum vertical thrust and maximum horizontal thrust on the workpiece on the other hand sufficient to effect simultaneous cutting and feeding of said saw and said workpiece one with respect to the other; and

(d) permitting said workpiece and said saw to move one with respect to the other to complete said cutting and feeding function to a predetermined degree due solely to the rotation of the blade and the relative positions of the blade and workpiece.

4,164,967

SCREWDRIVER

Konrad K. Breuers, P.O. Box 94441, Richmond, British Columbia, Canada

Filed Mar. 27, 1978, Ser. No. 890,344
Int. Cl.[2] B25B *15/00*
U.S. Cl. 145—50 A **2 Claims**

1. A screwdriver for screws having two spaced head recesses, the screwdriver comprising:

a tang with two ends,

a handle attached to a first end of the tang,

two spaced driving prongs attached at a second end of the tang for fitting into the recesses of one said screw,

resilient means for varying the spacing between the prongs so the screwdriver can be used on screws having different spacings between the recesses,

a first said prong being attached to the second end of the tang and a second said prong attached to said resilient means,

a slot at the second end of the tang, the slot having two sides, the second prong being movable within the slot to vary

the spacing between the prongs and being supported by the two sides of the slot when the screwdriver is used for screwing a screw,

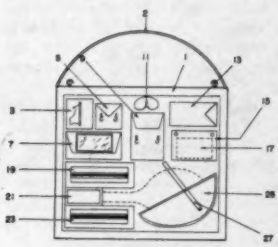
said resilient means comprising a curved metal spring with two ends, a first end of the spring attached to the tang generally halfway between the ends of the tang, and a second end of the spring being between the sides of the slot and attached to the second prong.

4,164,968

PORTABLE TENNIS LOCKER ORGANIZER

Joseph Esposito, Jr., and Andrew Peluso, Jr., both of 318 A St., Middlesex, N.J. 08846

Filed Jan. 26, 1978, Ser. No. 872,570
Int. Cl.[2] B65D *65/02*
U.S. Cl. 150—1 **6 Claims**



1. A portable tennis locker-organizer comprising in combination:

(a) a foldable bag-like member;

(b) a plurality of pouches permanently affixed to the interior surface of said bag-like member;

(c) a plurality of pocket compartments affixed in similar fashion as (b) above;

(d) a half moon shape pocket with strap fastener means permanently affixed to the interior surfaces of said bag-like means and positioned whereby a tennis racket placed within said pocket will like in a plane horizontally with respect to the vertical plane of said bag-like member in its unfolded position;

(e) a cylindrical sleeve pocket affixed to said bag-like member's interior surface and located in juxtaposition to the pocket described in (b) above whereby the handle of a tennis racket may be inserted therein while said racket's head is contained within pocket (d);

(f) a plurality of pocket enclosures containing zipper closure means affixed adjacent to said cylindrical sleeve pocket;

(g) a plurality of hanging means attached to one end of bag-like means, whereby, said bag-like means can be hung while in its unfolded position from structures such as fences and the like;

(h) a fastening means attached to exterior ends of said bag-like means to permit securing said bag-like means in a folded position.

4,164,969

GOLF CLUB HEAD COVERS IMPROVEMENT

Sam Dien, 156 Rockwood Pl., Englewood, N.J. 07613

Continuation of Ser. No. 819,179, Jul. 26, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 928,778
Int. Cl.[2] A63B *57/00*
U.S. Cl. 150—1.5 R **4 Claims**

1. A group of golf club covers for use in respectively covering a corresponding plurality of clubs each of which is identified by a different numeral and which are to be carried in a golf bag when the clubs are not in use, each of said covers comprising an enclosure for placement over the head of the associated golf club, and a first portion of Velcro material secured to the outer surface of each of said enclosures, a second portion of mating Velcro material being carried by one of an additional cover adapted to be carried by another of the golf clubs and a member secured to the golf bag, said first portion of Velcro material on one of said covers, when said one cover is removed from its associated club when the latter is in use, being capable of being releasably attached to said second portion of mating Velcro material, said first portion of mating Velcro material on each of said covers being formed in the shape of a different number respectively corresponding to the identifying number of the associated one of the golf clubs over which said cover is intended to be placed, when that club is not in use.

4,164,970

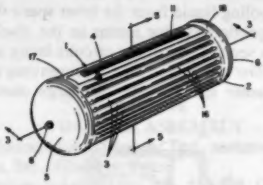
INFLATABLE BAG

Charles P. Jordan, 203 Fairlane Dr., Joliet, Ill. 60435

Filed May 25, 1977, Ser. No. 800,326
Int. Cl.[2] A45C *7/00*
U.S. Cl. 150—3 **4 Claims**

2. An inflatable container, comprising an inflatable side wall of flexible sheet material, a plurality of inflatable cells in said peripheral side wall, and closure means to close at least one end of said peripheral side wall to form a container having a cavity bounded by said inflatable peripheral side wall and said closure means, wherein said inflatable peripheral side wall includes a first pair of opposite side edges which are substantially parallel

when said side wall is unflexed, a second pair of opposite side edges which are substantially parallel to each other and substantially normal to said first pair of side edges when said side wall is unflexed, said first pair of side edges being joined to encircle said cavity within said peripheral side wall, said closure means including a first inflatable end wall joined to one side edge of said second pair of side edges, and a second inflatable end wall joined to the other side edge of said second pair,



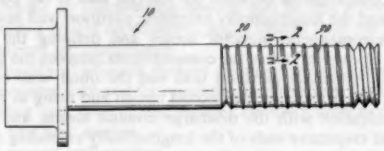
said inflatable cells in said peripheral side wall being closely adjacent to each other, said inflatable end walls being inflatable throughout their entire dimensional area, said end walls being directly joined in a watertight and airtight seal at each opposite end to respective edges of said peripheral side wall, said cavity being both watertight and insulated against heat transfer into and out of said cavity when said peripheral side wall and said end walls are inflated with air.

4,164,971

THREADED FASTENER PRODUCT WITH ADHESIVE COATING

Norman S. Strand, Howell, Mich., assignor to Federal Screw Works, Detroit, Mich.

Filed Nov. 1, 1976, Ser. No. 737,558
Int. Cl.[2] F16B *39/00*
U.S. Cl. 151—14.5 **9 Claims**



1. A fastener means having a thread connecting system for setting the fastener, wherein said fastener means includes an adhesive composition on said thread, said composition comprising in its uncured state, a solid epoxy particulate adhesive, a film forming carrier in which said adhesive is dispersed and which does not dissolve nor react with said adhesive, and a water resistant, non-reactive microencapsulated solvent dispersed in said film forming carrier, said solvent being operative upon release from its microencapsulated state to mix with and dissolve said adhesive and effect a cure of the adhesive composition.

4,164,972

BOXED AWNING ASSEMBLY

J. Richard Bennett, Fullerton, Calif., assignor to A & E Plastik Pak Co., Inc., Industry, Calif.

Continuation of Ser. No. 661,100, Feb. 25, 1976, abandoned.
This application May 20, 1977, Ser. No. 798,785
Int. Cl.[2] F04F *10/06*
U.S. Cl. 160—66 **15 Claims**

1. An awning assembly deployable from a stored position in proximity to a wall to an extended position extending from the wall, comprising:

a flexible sheet member forming an awning and having stored and extended conditions;

means including at least one main support arm and at least one rafter arm for supporting the awning in the extended position;

a container assembly connectible to the wall for enclosing at least the awning in the stored position;

a first back member included in the container assembly and defining a first wall of the container assembly;

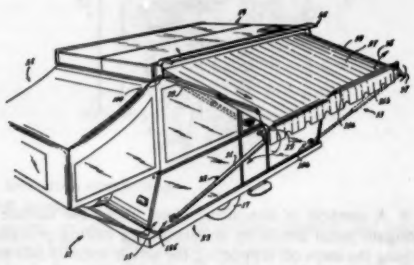
a second back member included in the containr assembly and extending in a direction transverse to the first back member and defining a second wall of the container assembly;

a plurality of channels disposed at spaced positions in at least one of the first and second back members;

a bracket having a pair of beads constructed to fit removably in a pair of spaced channels to provide for a variable disposition of the container relative to the wall, the bracket having a first flange extending between the beads and having a further flange extending in a transverse direction from the first flange for support by the wall;

means coupled to the first back member and the second back member for bracing the container assembly to provide a rigid relationship between the first back member and the second back member;

a lid pivotable with respect to the first and second back



members of the container assembly to provide for the reception of the awning in the stored position in the container and the unrolling of the awning from the container;

means including the bracing means for providing for a storage of the awning in the container in the stored condition on the bracing means;

means including the bracing means for providing for a storage of the rafter arm in the container in fixed relationship to the bracing means at a position below the awning and for providing for a pivotal movement of the rafter arm relative to the container to obtain the disposition of the awning in the extended condition; and

connector means including the bracing means, and having first and second ends, for providing for a storage of the main support arm in the container in a fixed relationship to the bracing means at a position above the awning and for providing a coupling of the main support arm to the awning at one end and for providing for a pivotal movement of the main support arm relative to the bracing means in a first plane about the second end of the connector means as a fulcrum in a second plane transverse to the first plane and independetly of the movement of the main support arm relative to the rafter arm in the first plane.

4,164,973

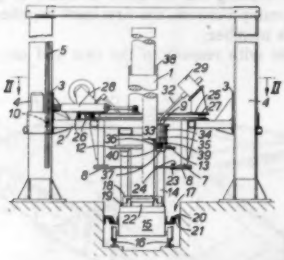
METHODS AND APPARATUS RELATING TO ELECTROSLAG DEPOSITION

Kenneth G. Hardwick, and Trevor Bagshaw, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed May 23, 1978, Ser. No. 908,622
Int. Cl.[2] B22D *27/02, 19/00*
U.S. Cl. 164—52 **14 Claims**

1. Electroslag casting apparatus for continuously depositing metal onto the surface of an elongate metal article comprising:

means for supporting the article with its axis substantially vertical, a vertically movable platform which is adapted to encompass the article, an open ended mould initially juxtaposed in selected spaced relation with the platform positioned around the article with an internal surface opposed to and spaced a predetermined distance away from the surface of the article to define a space between the surfaces, means carried by the platform for continuously feeding the metal in the form of a consumable electrode, which is to be deposited onto the surface of the article into the space defined between the opposed surfaces of the mould and the article, means for imparting vertical movement to the platform sufficient to enable a predetermined depth of solidified weld metal to be present in the mould and means for coupling the mould to the platform after a predetermined vertical movement of the platform relative to the mould, whereby the mould may be moved vertically by the platform.



9. A method of depositing metal about the surface of an elongate metal article by an electroslag casting process comprising the steps of: supporting the article with its axis substantially vertical, locating a mould about the perimeter of the article and providing a vertically movable means adjacent the mould, forming within the mould a bath of molten, electrically conductive slag, feeding into the molten slag at least one consumable electrode which carries electrical current to the slag and which progressively melts to produce weld metal which is to be deposited about the surface of the article, initially maintaining the mould stationary to enable a predetermined depth of solidified weld metal to be present in the mould and subsequently causing the mould to move vertically by coupling the vertically movable means with the mould after a predetermined vertical movement of the vertically movable means such that they progressively move over the surface of the article on which weld metal is to be deposited.

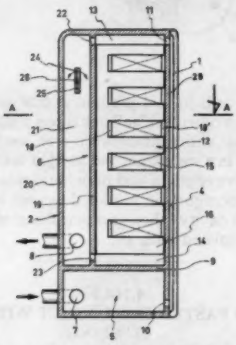
4,164,974

LIQUID-COOLED ELECTROMAGNETIC CONTINUOUS CASTING MOLD

Jacques Ruer, 87 bis rue Georges Ducrocq, and Louis Vedda, 31 avenue de Strasbourg, both of Metz, France (57000)

Filed Nov. 17, 1977, Ser. No. 852,208
Claims priority, application France, Nov. 17, 1976, 76 34681
Int. Cl.[2] B22D *27/02, 11/124*
U.S. Cl. 164—147 **2 Claims**

1. In a mold for the continuous casting of molten metal, which comprises a tubular mold element having two open ends and defining a passage for the casting between the open ends, a cooling casing surrounding and fastened to the tubular mold element, the casing having an outer wall and an interior wall defining therebetween an enclosed cooling space, and the interior wall defining with the tubular mold element an inner space, a transverse partition wall between the outer and interior walls at one end of the cooling casing to separate the enclosed cooling space into two superposed chambers, an inlet conduit means connected to one of the chambers for supplying a cooling liquid to the one chamber, a discharge conduit means connected to the other chamber for removing the cooling liquid therefrom, the inner space being in communication with the one chamber at one end of the interior wall and with the other chamber at the other end of the interior wall whereby the cooling liquid flows from the one chamber through the inner space for cooling the tubular element and into the other chamber, and an electromagnetic inductor means arranged in the other chamber for moving the molten metal in the passage: the improvement of means dividing the other chamber into two separate liquid flow circuits, a first one of the circuits circulating the cooling liquid from the inner space through the entire electromagnetic inductor means to the discharge conduit means, and a second one of the circuits being arranged in parallel with the first circuit and directly removing the cooling liquid from the inner space to the discharge conduit means



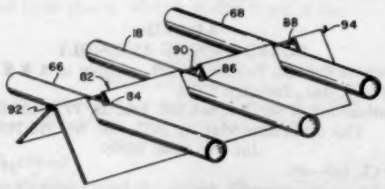
immediately after the cooling liquid has flowed through the inner space along the tubular mold element, the dividing means comprising an imperforate longitudinally extending partition wall dividing the other chamber into two laterally adjacent compartments fully separated from each other, an interior one of the compartments between the interior wall of the cooling casing and the longitudinally extending partition wall housing the electromagnetic inductor means and defining the first circuit, an exterior one of the compartments between the longitudinally extending partition wall and the outer wall of the cooling casing defining the second circuit and being in direct communication with the discharge conduit means, and port means at respective ends of the longitudinally extending partition wall for connecting the compartments and permitting circulation of the cooling liquid therethrough.

4,164,975

HEAT EXCHANGER HOLDER

Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116

Division of Ser. No. 715,306, Aug. 18, 1976, Pat. No. 4,049,407.
This application Jul. 1, 1977, Ser. No. 812,137
Int. Cl.[2] F28F *1/32*
U.S. Cl. 165—68 **4 Claims**



1. A heat exchanger holder for retaining at least two tubular coils in horizontal spaced apart heat exchange relationship comprising an elongated V-shaped member having an apex defining the upside thereof, said member being fabricated of

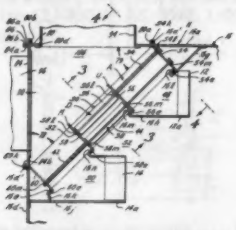
sheet-like heat conductive material, said member having at least two spaced apart slots extending transversely downwardly from the apex thereof, each slot for reception of a tubular coil, and means for securing the coils in place comprising an elongated rod-like element inserted beneath said apex and above said coils having ends extending out of the ends of the V-shaped member and being bent to retain said rod-like element in place.

4,164,976

DAMPER ASSEMBLY

Walter C. Timmerman, Houston, Tex., assignor to Timmerman Engineers, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 519,349, Oct. 30, 1974, abandoned. This application Jan. 17, 1977, Ser. No. 759,920
Int. Cl.[2] F28F *27/02, 9/26;* F24F *13/14*
U.S. Cl. 165—101 **15 Claims**



1. A damper assembly adapted to be affixed to an air-handling unit at an installation site with the air handling unit being a multizone air conditioning-heating unit having a heated air chamber, a cooled air chamber, and a neutral zone for receiving ambient air, comprising:

a plurality of adjacent damper assembly units adapted to be mounted with and for regulating air flow from the air-handling unit, each of said damper assembly units having:

a first wall section;

a second wall section;

damper means adapted to be disposed between said first wall section and said second wall section for regulating air flow exiting the air-handling unit; and,

mounting means for mounting said first wall section in a fixed spacial relation to said second wall section and for mounting said damper means between said first wall section and said second section wall section, said mounting means including at least two partition plates for positioning said first wall section substantially parallel with said second wall section, said partition plates being disposed between said first and second wall sections of said damper assembly unit for mounting said damper means with said damper assembly unit;

interlocking means with said wall sections for interlocking said adjacent wall sections of said adjacent damper assembly units;

said damper assembly units including a first damper means and a second damper means;

said first damper means mounted with said heated air chamber and said neutral zone for simultaneously controlling relative mixing proportions of heated air and ambient air; and,

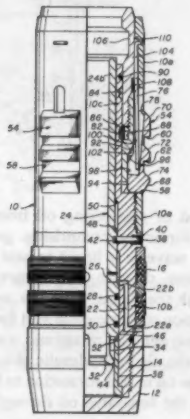
said second damper means mounted with said cooled air chamber and said neutral zone for simultaneously controlling relative mixing proportions of cooled air and ambient air, independent of said first damper means.

4,164,977

WELL LATCH

Henry P. Arendt; Thomas M. Deaton, both of Dallas, and Donald L. Dooley, Royse City, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 11, 1977, Ser. No. 786,380
Int. Cl.[2] E21B *23/06, 33/126, 33/129*
U.S. Cl. 166—125 **19 Claims**



1. A well latch comprising:

a latch housing;

seal means on said housing for sealing between said latch housing and a landing nipple in a well;

said latch housing having equalizing passage means for extending between a first pressure region exterior of said latch housing and a second pressure region interior of said housing;

key means carried by said housing and adapted to move radially outwardly for locking the well latch in a landing nipple;

expander sleeve means axially movable with respect to said latch housing between a first position permitting retraction of said key means into said latch housing and a second position maintaining said key means in an expanded position;

fishing neck means associated with said expander sleeve means and movable in unison with said expander sleeve means with respect to said latch housing and including recess means for engagement by a fishing tool;

valve means disposed in said latch housing and movable independently of said expander sleeve means with respect to said latch housing between a first position permitting flow through said equalizing passage means and a second position preventing flow through said equalizing passage means, said valve means being adapted to be moved to its second position when the well latch is locked in a landing nipple;

releasable stop means for preventing unintentional movement of said valve means from its second position to its first position; and

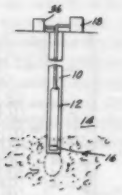
means associated with said valve means for preventing a fishing tool from engaging said fishing neck recess means until said valve means is moved to its first position and including an extension on said valve means, said extension extending across said recess means and interferring with access to said recess means when said valve means is in its second position and said expander sleeve means is in its second position and not interferring with access to said recess means when said valve means is in its first position.

4,164,978

OIL EXTRACTION METHOD

Harold W. Scott, Ridgefield, Conn., assignor to Winton Corporation, Ridgefield, Conn.

Filed Feb. 21, 1978, Ser. No. 879,484
Int. Cl.[2] E21B *43/25*
U.S. Cl. 166—249 **4 Claims**



1. A method of recovering oil from a wellhole in an oil bearing earth formation comprising: generating an electrohydraulic shock wave in a liquid in said wellhole by capacitor discharge means; directing the generated shock wave outwardly through the liquid, from the wellhole and into the oil bearing formation to cause oil in said formation to be separated therefrom; generating an ultrasonic wave in said liquid in the region where the electrohydraulic shock wave was generated to further cause oil in said formation to be separated therefrom, and removing the separated oil through the wellhole.

4,164,979

RESERVOIR STABILIZATION BY TREATING WATER SENSITIVE CLAYS

Daryl W. Nooner, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,882
Int. Cl.[2] E21B *43/22, 43/24*
U.S. Cl. 166—288 **7 Claims**

1. A method of altering the matrix of a hydrocarbon-bearing formation having present therein montmorillonite clays, comprising the steps of introducing via a wellbore penetrating said formation a heated aqueous solution of a potassium salt of an organic acid, continuing injection of said solution until said matrix is heated to a minimum temperature of about 260° C. for a desired radial distance from said wellbore, whereby said matrix is stabilized by mineralogically altering said montmorillonite clays.

4,164,980

WELL CEMENTING METHOD AND APPARATUS

John A. Duke, 418 Pamela St., Baytown, Tex. 77521

Filed Aug. 2, 1978, Ser. No. 930,138
Int. Cl.[2] E21B *33/05, 33/16*
U.S. Cl. 166—291 **6 Claims**

1. A method of cementing a well conduit in a well bore comprising the steps of:

forming a well conduit to be cemented in the well bore at a work surface disposed above the well bore;

mounting a hanger with the well conduit for supporting the well conduit in the well; mounting a cementing plug container above the well conduit;

connecting the cementing plug container with a tubular string for supporting the well conduit and the cementing plug container from the work surface;

flowing a cement slurry through the tubular string to the cementing plug container;

manipulating the tubular string to operate the cementing plug container to release a first cementing plug;

moving the first cementing plug downwardly through the well conduit;

manipulating the tubular string to operate the cementing plug container to release a second cementing plug;

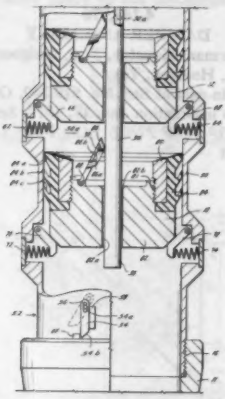
moving the second cementing plug downwardly through the well conduit through the well conduit into engagement with the first cementing plug for internally clearing the well conduit of cement slurry while forcing the cement slurry into the well bore.

4. Well cementing plug apparatus, including:

a tubular body forming a central passageway;

means for connecting said tubular body with a well conductor to be cemented in a bore hole;

means for connecting said tubular body with a tubular support for supporting said tubular body,



a plurality of cementing plugs releasably disposed in said central passageway, each of said cementing plugs having a flow passage formed therethrough and a movable closure element for closing each said flow passage; and

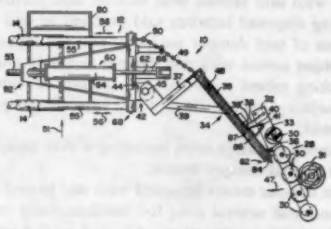
means movably mounted with said tubular body for extending through said flow passage of each said cementing plug to form a circulation flow passage past said cementing plugs, said means being withdrawable from said central passageway to enable said movable closure element to close said flow passage through each said cementing plug in response to manipulation of the tubular support.

4,164,981

AGRICULTURAL HARVESTING ASSEMBLY

Thomas E. Myers, Rte. 5, Box 428, Dade City, Fla. 33525

Filed Dec. 16, 1974, Ser. No. 533,000
The portion of the term of this patent subsequent to Aug. 21, 1993, has been disclaimed.
Int. Cl.[2] A01D *25/00*
U.S. Cl. 171—50 **15 Claims**



1. An agricultural assembly primarily designed for removing vines and like growth extending from the ground and secured to the upper portion of a tree with the vine or like growth being spaced from the trunk of the tree, the agriculture assem-

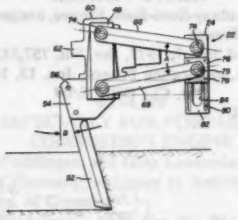
bly normally operated in towed relation to a prime mover type vehicle; said agriculture assembly comprising: frame means movably connected in towed relation to the prime mover type vehicle, a gripping head movably mounted on said frame, orienting means connected to said gripping head and disposed to at least partially define the path of travel of said gripping head relative to said frame, biasing means connected to said orienting means and disposed to normally bias said head into a substantially predetermined position relative to the path of travel of said frame to remove the vines or like growth from the ground as said gripping head travels relative to the tree; and said biasing means disposed relative to said gripping head, orienting means and said frame means for absorbing the shock when said gripping head engages the tree and for enabling movement of said gripping head from said substantially predetermined position as the gripping head engages the tree and passes thereby.

4,164,982

VIBRATORY CABLE PLOW ASSEMBLY

Robert G. Draney, Wichita, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 27, 1978, Ser. No. 881,219
Int. Cl.[2] E02F *5/02*; F16L *1/00*
U.S. Cl. 172—40 **12 Claims**



10. A vibratory plow assembly for laying an elongated element underground comprising, in combination, a resilient frame assembly to be mounted on a ground traversing vehicle, said frame assembly having a forward frame member mounted on said vehicle, side frame members on each side of said frame resiliently supported on pivotal connections on said forward frame member, a rearward frame member resiliently supported by said side frame members on resilient pivotal connections, a generally vertical plow blade and a vibrator shaker means supported on said rearward frame member, such that said plow blade is vibrated by said shaker means about said resilient pivotal connections, the improvement comprising: said side frame members each including two generally vertically spaced elongated links converging in spaced relation toward said forward frame member and said vehicle at an acute relative angle of about fifteen to twenty degreees, the forward and rearward ends of each link pivotally connected respectively to said forward and rearward frame members, said vibrator shaker means thereby generating an elliptical ground cleaving motion in said blade about said pivotal connections.

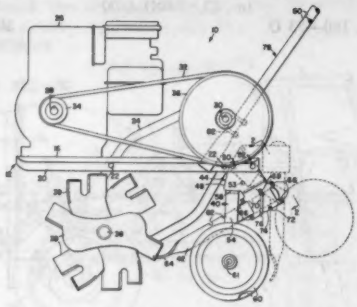
4,164,983

WALK-BEHIND FILLER WITH COMBINED DRAG STAKE AND WHEEL

John J. Hoch, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Feb. 21, 1978, Ser. No. 879,202
Int. Cl.[2] B62D *51/04*; A01B *33/02*
U.S. Cl. 172—43 **10 Claims**

1. In a walk-behind rotary tiller including a frame having a set of rotary tines, a pair of transversly spaced wheels and a drag stake secured thereto and disposed therebeneath, with the wheels and drag stake being located rearwardly of the tines and with the drag stake being mounted for pivoting between a raised transport position and a lowered working position, wherein said drag stake has a lower end which moves rearwardly from said transport to said working position, the improvement comprising: said drag stake both extending between



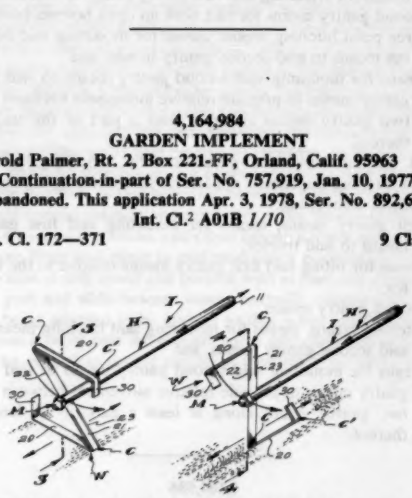
said transversely spaced wheels and being entirely located no further rearward than the bottom most surface of the wheels when the drag stake is in its working position; and said drag stake further having an upper end disposed rearwardly farther than that location where the wheels are secured to the frame.

4,164,984

GARDEN IMPLEMENT

Harold Palmer, Rt. 2, Box 221-FF, Orland, Calif. 95963

Continuation-in-part of Ser. No. 757,919, Jan. 10, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 892,683
Int. Cl.[2] A01B *1/10*
U.S. Cl. 172—371 **9 Claims**

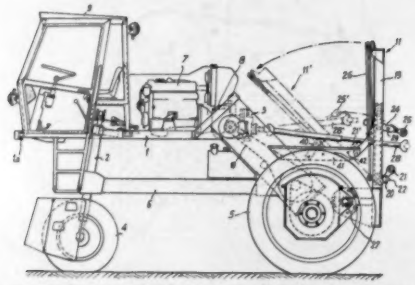


1. A garden implement including an elongate manually engageable handle with front and rear ends, a substantially Z-shaped working head and coupling means coupling the head with the front end of the handle, said head is a unitary part established of a single length of flat metal strap formed to establish a pair of flat, elongate, straight, parallel and laterally spaced blades, a flat, straight and elongate central member extending diagonally between and integrally joined with related ends of the blades at acute angle and cooperating therewith to define acute V-shaped corner portions; said head is on a plane normal to the longitudinal axis of the handle with the axis of the handle intersecting the member intermediate the ends thereof and with the planes of the blades and member parallel with the longitudinal axis of the handle, whereby said blades and member have straight, axially forwardly and rearwardly disposed work engaging edges.

4,164,985
STRADDLING TRACTORS

Charles E. Bobard, Gigny, France, assignor to ETS. Bobard Jeune S.A., Beaune, France

Filed Feb. 10, 1978, Ser. No. 876,635
Claims priority, application France, Feb. 11, 1977, 77 03873
Int. Cl.[2] B60D *1/00*
U.S. Cl. 180—53 D 30 Claims



1. Apparatus for hitching implements to a stilt-type tractor having a body of a generally inverted U shape to permit crops to pass thereunder comprising:

first gantry means formed with an open bottom portion, means for attaching said first gantry means to said tractor,

second gantry means formed with an open bottom portion,

three point hitching means, means for mounting said hitching means to said second gantry means, and

means for mounting said second gantry means to said first gantry means to provide relative movement between said two gantry means along at least a part of the lengths thereof.

26. The combination of a tractor of the straddling leg type and a hitching implement apparatus, said hitching implement apparatus comprising:

first gantry means, means for mounting said first gantry means to said tractor,

means for tilting said first gantry means relative to the tractor,

second gantry means,

hitching means, means for mounting said hitching means to said second gantry means, and

means for mounting said second gantry means to said first gantry means to provide relative movement between said two gantry means along at least a part of the lengths thereof.

4,164,986
DEVICE FOR FIXING A PANEL ON AN AUTOMOBILE DASHBOARD

Jacques Eloy, Montbeliard, and Claude François, Audincourt, both of France, assignors to Automobiles Peugeot, Paris, France

Filed Aug. 22, 1977, Ser. No. 826,680
Claims priority, application France, Sep. 17, 1976, 76 28101
Int. Cl.[2] B60K *20/08*; A44B *17/00*
U.S. Cl. 180—90 9 Claims

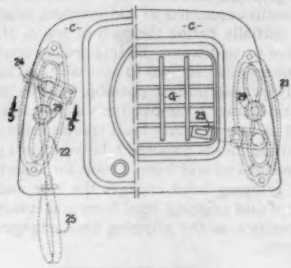
1. A device for removably fixing, by interlocking, a first element on a second element and comprising:

a pin provided with a shouldered head, securely fastened to said second element,

a clip fastened to said first element and adapted to receive and removably grip the pin, wherein the clip is constituted by:

(a) a frame,

(b) two resilient lips provided in said frame and integral therewith, and defining a central recess adapted to receive said pin, and at least one lateral recess,

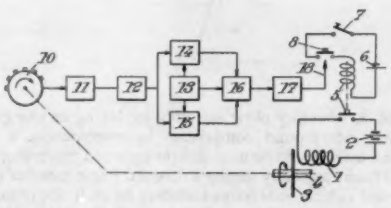


(c) a member for spacing said lips apart in order to release said pin, said lip-spacing member being rotatably mounted on said frame and comprising an angularly movable finger engaged within said lateral recess.

4,164,987
CONTROL DEVICE FOR THE DECELERATION OF A HEAVY VEHICLE

Roger Lagarde, Aulnay-Sous-Bois, France, assignor to Labavia - S.G.E., Paris, France

Filed Jan. 7, 1977, Ser. No. 757,513
Claims priority, application France, Jan. 13, 1976, 76 00716
Int. Cl.[2] B60T *8/04*
U.S. Cl. 180—271 16 Claims



1. A device for controlling a vehicle having friction brakes, a decelerator, and means for selectively actuating said decelerator; said device comprising: means for automatically neutralizing said selectively actuating means in response to the deceleration of said vehicle exceeding a predetermined value, said perdetermined value being a level of deceleration which would be likely to cause skidding of the vehicle in an empty or lightly loaded condition but not in a full or heavily loaded condition.

4,164,988
FINE TUNED, COLUMN SPEAKER SYSTEM

John J. Virva, Chicago, Ill., assignor to Admiral Corporation, Schaumburg, Ill.

Filed Aug. 25, 1976, Ser. No. 717,755
Int. Cl.[2] H05K *5/00*
U.S. Cl. 181—156 4 Claims

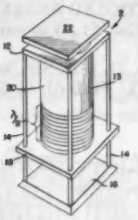
1. A finely-tuned loudspeaker system capable of reproducing efficiently low frequency sounds, comprising:

(a) a high compliance loudspeaker having a specific in-air resonance frequency f_o, which may vary within a relatively wide range of possible frequencies;

(b) support means for said loudspeaker comprising a baffle board for receiving and supporting said loudspeaker, a support frame and a slideable board with an aperture in said board slideable in said support frame; and

(c) an adjustable air column tube connected at one end to the

rear of said loudspeaker and connected at the other end to said slideable board, said air column tube being open from said loudspeaker through said slideable board, said air column tube being adjustable so that its length may be infinitely varied over a relatively wide range corresponding to said range of possible frequencies to one-quarter of a wavelength of the specific frequency f_o, whereby said loud-speaker system may be finely tuned to tend to flatten the output of said speaker over the frequency range of said speaker.



4,164,989

MUFFLER, ESPECIALLY FOR PORTABLE INTERNAL COMBUSTION ENGINE

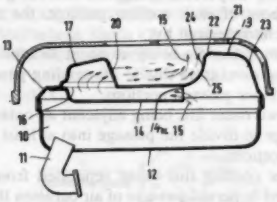
Helmut Lux, Waiblingen, and Götz Landwehr, Berglen, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 913,030

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2725899

Int. Cl.² F01N *1/08*

U.S. Cl. 181—265 **17 Claims**



1. A muffler, especially for a portable internal combustion engine of a motor chain saw, which includes an exhaust gas receiving container defined by a container wall having an aperture therethrough and by a pan-shaped housing wall having an inlet for admitting exhaust gas into said container, exhaust gas conveying means communicating with said exhaust gas container for receiving and deflecting an exhaust gas current and conveying the deflected exhaust gas current through said aperture, said exhaust gas conveying means comprising bend means arranged on the outside of said container wall and projecting from said container wall and being provided with an outlet for conveying the exhaust gas current through said outlet at least approximately parallel to a portion of said container wall, and turbulence creating means extending transverse to the outflow direction of the exhaust gas current through said outlet for creating turbulence in the last mentioned exhaust gas current.

4,164,990

PASSENGER EVACUATION APPARATUS

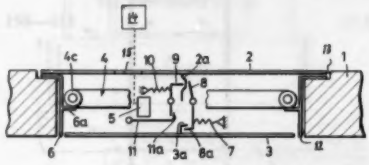
Christian Stiefel, Aachen, and Fritz Frederich, Krefeld, both of Fed. Rep. of Germany, assignors to Waggonfabrik Uerdingen Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 752,307, Dec. 30, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 872,795

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558225

Int. Cl.² A62B *1/20*

U.S. Cl. 182—48 **11 Claims**



1. A passenger evacuation apparatus for use in a passenger-carrying cabin having a floor suspended above the ground, comprising an upper plate engageable with and normally overlying the upper side of a vertical hole through said floor and normally lying generally level with said upper side; a lower plate engageable with the lower side of said hole; securing means including a linkage in said hole connected between said plates and an electromagnet operatively connected to said linkage for securing both of said plates to said floor at the respective sides in a normal position and for releasing both of said plates from each other in an emergency position for opening-up said hole from both sides and for dropping-away of said lower plate; means in said cabin and connected to said electromagnet for detecting fire and operating said electromagnet to place said linkage in said emergency position on detection of fire; and a tubular life-saving chute secured to said floor between said sides in said hole and folded up between said plates in said normal position and extensible down from said floor in said emergency position, said chute having a lower end portion remote from said cabin in said emergency position and being provided at said lower end portion with at least one elongated exit port and slide-fastener means normally closing said port and being adapted to be opened so that when said lower end portion is on or near the ground below said cabin said exit port can be opened to permit exiting of a person from said chute.

4,164,991

FIRE ESCAPE DEVICE

Aldo Marra, 11 Wood St., San Francisco, Calif. 94118

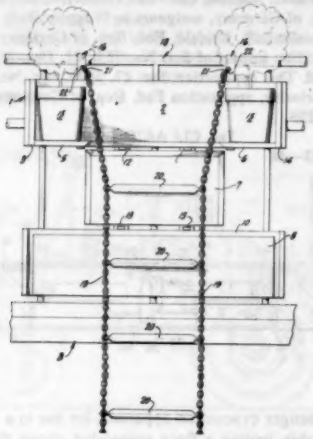
Filed Apr. 3, 1978, Ser. No. 892,759

Int. Cl.² E06C *9/14, 1/36, 1/56*

U.S. Cl. 182—70 **7 Claims**

1. A fire escape device for a building comprising a box having a back panel, a pair of bottom end panels fixed to said back panel, a bottom central panel, first hinges connecting said bottom central panel to said back panel, a front panel, second hinges connecting said front panel to said bottom central panel, means supporting said front panel on said bottom end panels and for releasing said front panel from said bottom end panels by outward swinging of said front panel about said second hinges, a top panel adapted to interengage the top of said back

panel and the top of said front panel, a ladder of chains and rungs adapted to be disposed largely within said box on said



bottom central panel, and means associated with said box for transferring weight from said chains to said building.

4,164,992

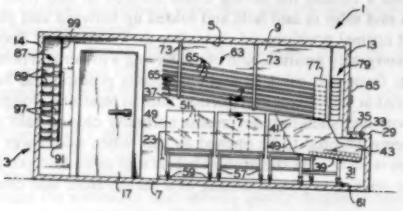
DISPENSING UNIT

Lawrence B. Luber, deceased, late of Sikeston, Mo., and Beulah Luber, Intestate Successor, 706 Hunter St., Sikeston, Mo. 63801, assignors to Beulah F. Luber, Sikeston, Mo.

Filed Nov. 16, 1977, Ser. No. 851,811

Int. Cl.[2] E04H *3/04*

U.S. Cl. 186—1 R **10 Claims**



1. A unit for dispensing chilled cans and bottles of beverage on a first-in, first-out basis, said unit comprising a walk-in cooler having a ceiling, a floor, and front, rear and side walls, the front wall having an offset portion extending generally horizontally forwardly and then vertically downwardly for providing an elongate generally horizontal counter at the front of the cooler outside the cooler and a recess below the counter inside the cooler, said counter having a plurality of openings therein spaced along the counter and doors for closing the openings, and a plurality of mobile receptacles, one for each opening, for holding a supply of chilled cans and bottles of beverage inside the cooler, each of said receptacles having a bottom, an inlet through which cans and bottles are loaded into the receptacle, and an outlet through which cans and bottles are removed from the receptacle, said receptacles being adapted to be positioned side-by-side in said recess below the counter with the outlet of each of the receptacles directly beneath and immediately adjacent one of the counter openings for removal of the cans and bottles from the receptacle and out of the cooler via said opening, the bottom of each of the receptacles being spaced a sufficient distance above the floor of the cooler and close enough to a respective counter opening for convenient removal of cans and bottles on the bottom of the receptacle from the receptacle and out of the cooler via the opening, said receptacles presenting the cans and bottles for removal therefrom on a first-in, first-out basis.

4,164,993

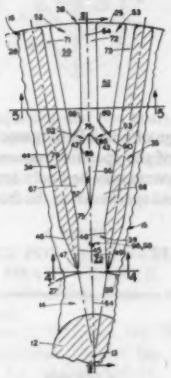
AIR COOLED BRAKE DISC

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada (V6M 2W2)

Filed Feb. 21, 1978, Ser. No. 879,888

Int. Cl.[2] F16D *65/12, 65/847*

U.S. Cl. 188—218 XL **10 Claims**



1. An air cooled brake disc having first and second disc-shaped face portions, each face portion having an outer braking surface and an inner surface, at least one face portion having cooling air inlet means adjacent an inner portion of the disc, a plurality of radially disposed webs extending between the face portions from the inner portion of the disc to an outer portion of the disc, the webs defining with inner surfaces of the face portions a plurality of radially extending cooling passages within the disc, each cooling passage having a plurality of generally radially disposed cooling fins extending from opposite inner surfaces of each cooling passage, the cooling fins being further characterized by:

(a) at least one inner fin being adjacent an inner portion of the cooling passage to divide the cooling passage into at least two inner passage portions,

(b) at least two outer fins being adjacent an outer portion of the passage to divide the passage into at least three outer passage portions,

(c) the inner cooling fins being separated from the outer cooling fins to permit passage of air between the inner and outer passage portions.

4,164,994

HYDRAULIC EDDY BRAKE

Hans-Walter Dodt, Darmstadt, and Dieter Kraft, Griesheim, both of Fed. Rep. of Germany, assignors to Firma Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 697,956, Jun. 21, 1976, abandoned.

This application Sep. 13, 1977, Ser. No. 832,908

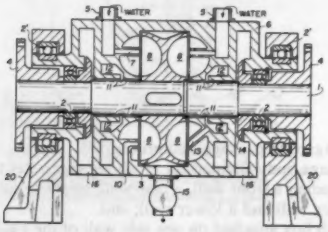
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1975, 2536794

Int. Cl.[2] F16D *57/02*

U.S. Cl. 188—296 **10 Claims**

1. A hydraulic eddy brake comprising stator means and rotor means including a rotor shaft, said stator means and said rotor means defining an eddy chamber having peripheral high pressure zones and a central low pressure zone, liquid supply means connected to supply liquid substantially centrally into said low pressure zone of said eddy chamber, said rotor shaft

(1) supporting said rotor means, bearing means rotatably supporting said rotor shaft relative to said stator means, a smooth axial bore having a given inner diameter extending through said stator means, said rotor shaft extending axially through said bore, gap means (11) located substantially between the rotor shaft (1) and said stator means (6), leakage liquid discharge means (16) operatively connected to said gap means (11) and liquid feed-back conduit means (12, 13: 5', 7) operatively and directly connecting said gap means (11) substantially centrally into said low pressure zone of said eddy chamber (8) whereby the pressure difference between the pressure in said central low pressure zone and the liquid leakage pressure in said gap means (11) is substantially minimized and a major



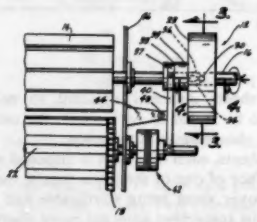
proportion of the leakage liquid is returned into said central low pressure zone so that elastic sealing means between the rotor shaft and the stator means are obviated, said hydraulic eddy brake further comprising means secured to said rotor shaft and rotating with the rotor shaft for avoiding gradual locking of the rotor shaft by boiler scale and corrosion products, said locking avoiding means comprising a plurality of closed rings (201) spaced by closed grooves (200), said closed rings and closed grooves being operatively interposed between said rotor shaft (1) and said stator means (6) in gap means (11), said closed rings having a saw tooth cross section and an outer diameter smaller than said given inner bore diameter so that a spacing is provided between the rotor shaft and the stator means to form said gap means (11).

4,164,995

INERTIA CONTROLLED CONVEYOR CLUTCH

Douglas F. McFarland, Davis City, Iowa 50065

Filed May 19, 1977, Ser. No. 798,371
Int. Cl.[2] F16D *43/24*
U.S. Cl. 192—103 C **7 Claims**



1. In combination,

a harvesting machine having a first drive shaft, a feeder conveyor chain assembly with a second drive shaft, and a friction drive clutch connected to said second drive shaft to disengage said feeder conveyor chain, and

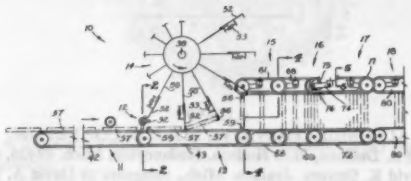
a governor control device comprising a flywheel having a center aperture slidably receiving said first drive shaft, means for connecting said flywheel to said first drive shaft so that the rotation of said first drive shaft rotates said flywheel and a decrease in the rotational speed of said first drive shaft relative to said flywheel causes said flywheel to move along said first driveshaft, and means for connecting said flywheel to said friction drive clutch such that the movement of said flywheel along said first drive shaft disengages said feeder conveyor chain.

4,164,996

TILE STACKING MACHINE AND METHOD

Robert K. Tomlinson, Woodville, Australia, assignor to Concrete Industries (Monier) Limited, Woodville, Australia

Filed Aug. 5, 1977, Ser. No. 822,336
Claims priority, application Australia, Aug. 6, 1976, PC6894
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—415 **11 Claims**



1. A method of stacking tiles which are conveyed by a conveyor to travel edgeways, comprising:

(a) engaging the leading edge of each successive tile by a finger of a rotating tilting head and lifting upwardly so that each said tile is supported in turn on its then lower edge while the lower edge is being conveyed at high speed on a high speed conveyor,

(b) engaging said lower edge of each tile after it has been tilted with a lower belt and releasing the tilting head finger from the tile upper edge while simultaneously transferring the upper edge into engagement with an upper belt of a set of speed reducing belts thereby transferring each tile in turn from said high speed conveyor,

(c) driving the belts of said set of speed reducing belts at a lower speed than said high speed conveyor thereby conveying each said tile at a reduced speed in a face to back relationship, and

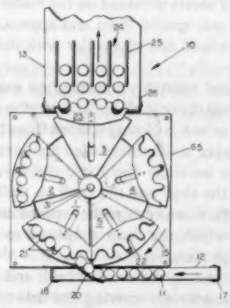
(d) removing said stack of tiles so formed from the speed reducing belts conveying it, and transferring to a packing locality.

4,164,997

ARTICLE TRANSPORT DEVICE AND METHOD

Martin Mueller, Wonderlake, Ill., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 2, 1977, Ser. No. 764,783
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—427 **14 Claims**



1. An apparatus for conveying a plurality of containers

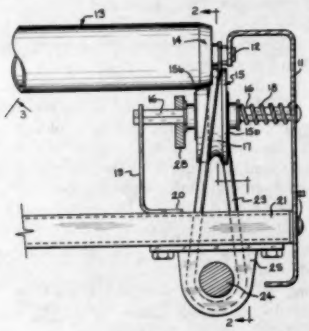
through an arcuate path including an articulated starwheel, said starwheel comprised of a plurality of sectors each pivoted for independent movement around a central point, drive means for supplying rotational power to a shaft, the axis of which coincides with said central point, means for coupling and uncoupling said rotational power to said sectors so that said sectors move at least through a portion of their arcuate travel at a constant angular velocity, auxiliary drive means coupled to said drive means for engaging said sectors and accelerating and deaccelerating said sectors in an arcuate direction and means coupled to said drive means for simultaneously ejecting all of the containers transported by each sector.

4,164,998

ACCUMULATION LIVE ROLLER CONVEYOR

David A. DeGood, 3174 Hudson, Hudsonville, Mich. 49426, and David K. Stevens, Jenison, Mich., assignors to David A. DeGood, Hudsonville, Mich.

Filed Feb. 16, 1977, Ser. No. 768,980
Int. Cl.[2] B65G *13/06*
U.S. Cl. 198—781 **17 Claims**



1. In a live roller conveyor apparatus including a frame, a plurality of live rollers mounted on longitudinal axes at both ends on the frame in spaced relation and defining a pass line along which articles supported on the rollers are transported, the improvement which comprises:

(a) a tapered surface at one end of each of a plurality of the rollers which provide powered transport of the articles on the pass line;

(b) a plurality of shafts mounted on the frame each having its longitudinal axis spaced from and approximately parallel to the longitudinal axis of a roller with the end surface to be powered;

(c) a drive wheel rotatably mounted on each shaft with a radial frictional drive surface, wherein the drive wheel has an inner rim which is closely spaced from the roller and an outer rim larger in diameter than the inner rim with the drive surface between the rims, the drive wheel being mounted on the shaft and the shaft on the frame such that the drive surface can engage the tapered end surface of the roller from which the shaft is spaced to provide power and disengage therefrom;

(d) means for rotating the drive wheel; and

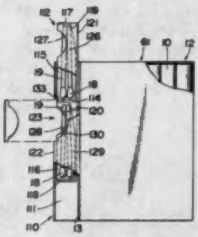
(e) means for selectively moving the drive wheel and thus the drive surface into and out of engagement with the end surface of the roller.

4,164,999

CIGARETTE PACKAGE

Tatumi Tsukamoto, 2570, Ohaza Mukaizima, Chiyodamachi, Kanzaigun, Sagaken, Chiyodamachi, Japan

Filed Mar. 14, 1978, Ser. No. 886,445
Int. Cl.[2] A24F *15/10*
U.S. Cl. 206—91 **4 Claims**



1. A cigarette package comprising;

a package body adapted for receiving cigarettes therein and including a front wall, a rear wall, opposite side walls, an upper wall and a lower wall; and

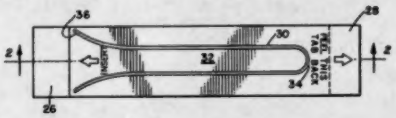
a match box attached on one side wall of the package body, the match box including a rectangular outer frame having a back wall surface conforming to the shape of a side wall of said package body and a receptacle box adapted to be freely slidable in said outer frame and divided into upper and lower chambers by a partition, the upper and lower chambers adapted to receive matches therein, the outer frame having a detachable cover over an opening in the lower chamber, which cover is removable after unsealing of the cigarette package so that when the receptacle box is pushed upwardly the matches can be removed from both the upper and lower chambers thereof.

4,165,000

TEAR-TAB STERILE THERMOMETER SHEATH

George W. Poncy, 12540 U.S. 1, North Palm Beach, Fla. 33408

Filed Feb. 14, 1975, Ser. No. 550,000
Int. Cl.[2] A61B *19/02*; B65D *65/26*
U.S. Cl. 206—306 **13 Claims**



1. A sheath-package comprising:

two inner sheets disposed adjacent to each other and adapted to be sealed to each other, the outer surfaces of said inner sheets being sterilizable,

two cover sheets, each of which is disposed adjacent to the outer surface of one of the inner sheets, the inner surface of each cover sheet being sterilizable and adapted to be sealed to its respective adjacent inner sheet,

a sheath formed by joining the inner sheets together along a seal line in the form of a tear seal, the portions of the inner sheets outside of the tear seal forming waste portions, the seal line terminating at two end points to define a mouth adapted for insertion of an instrument into the sheath,

said two end points being spaced from the ends of both of said inner sheets and both of said cover sheets to form a tab from the portions of the inner and outer sheets projecting beyond the mouth,

the respective adjacent inner and cover sheets being sealed together at least along the seal line and between the two end points of the seal line;

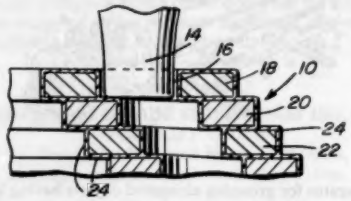
said cover sheets each including a weakened portion across substantially the entire width thereof near the mouth so that the cover sheet can easily be separated along the weakened portion.

4,165,001

BONDED STACKED SNAP RINGS

Thomas F. Cooper, 2203 Airport Rd., Opelika, Ala. 36801

Filed Jul. 10, 1978, Ser. No. 923,319
Int. Cl.[2] B65D *85/24*
U.S. Cl. 206—343 11 Claims



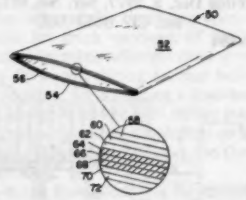
1. An arrangement of a plurality of split retainer rings, adapted to be operated by a ring-withdrawing and assembling tool having tips, comprising a stack of said rings bonded together, each of said rings having retainer ring holes offset from retainer ring holes in adjacent rings comprising said stack whereby the tips can be inserted into the holes in only the endmost ring.

4,165,002

PRODUCT AUTHENTICATION SYSTEM

Richard R. Meagher, Toms River, N.J., assignor to The Rescon Corporation, Newark, N.J.

Filed Jun. 16, 1977, Ser. No. 807,222
Int. Cl.[2] B65D *75/28*
U.S. Cl. 206—459 38 Claims



1. A device for authenticating a product contained in a package, comprising:

a plurality of walls connected to form said package,

at least one of said walls having two external surfaces and including a sheet of paperboard material having an exposed edge along said at least one wall, said sheet being formed from a plurality of plies of paperboard material to form an integral laminate,

at least one ply of said plurality of plies being coded between said external surfaces of said at least one wall along at least a portion of a surface of said one ply covered by said other plies and along an exposed outer edge thereof to act as an indicator, and

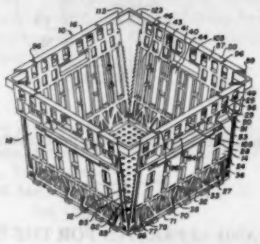
the exposed outer edge of said coded ply being visible along the exposed edge of said at least one wall to indicate the authenticity of said product.

4,165,003

STACKABLE AND NESTABLE CONTAINERS

Clarence H. Drader, R.R. 2, South Edmonton, Alberta, Canada (T6C 4E6)

Filed Mar. 13, 1978, Ser. No. 885,742
Int. Cl.[2] B65D *21/06*
U.S. Cl. 206—506 21 Claims



1. A container that can be quickly stacked and deeply nested, comprising:

a rectangular bottom panel;

side walls arranged in first and second opposed pairs and extending upwardly from edges of the bottom panel, each side wall having a top, a bottom, two vertical ends, and two mutually opposing side walls adjacent thereto, said side walls being mounted to swing between closed upright positions and outwardly inclined nesting positions relative to the bottom panel;

two latch members movably mounted on each side wall near the top thereof, each latch member having an inner end and an outer end, the outer end being near one of the vertical ends of said each side wall, the outer end of each latch member being rigidly interconnected to the outer end of an adjacent said latch member of one of the adjacent side walls;

latch means near the inner ends of the latch members for mutually and releasably interconnecting the inner ends of the latch members of each side wall to prevent movement thereof and thereby lock the two mutually opposing side walls adjacent said each side wall in the upright position, said latch means being operable to release the inner ends of the latch members interconnected thereby to free said two adjacent side walls for movement towards the nesting position; and

spring means mounted for urging each side wall to swing automatically from said upstanding positions to said nesting positions when each side wall is free to move by the releasing of said latch members.

4,165,004

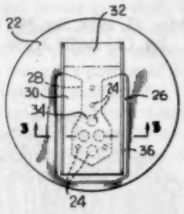
INWARD EMBOSSED PANEL ADJACENT TO PUNCHED POUR HOLE IN TOP END UNIT

Herbert D. Bartels, Palos Heights, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,569
Int. Cl.[2] B65D *17/16*
U.S. Cl. 206—631 11 Claims

1. In an easy opening container, a wall portion having a dispensing opening, a pull tape overlying said dispensing opening, and a peelable bond between said pull tape and said container wall portion, the improvement comprising said container wall portion having an area raised relative to a surrounding part of said wall portion, said raised area being of a size materially less than that of said wall portion and of a predeter-

mined pattern surrounding said dispensing opening, said raised area defining the configuration and area of said peelable bond



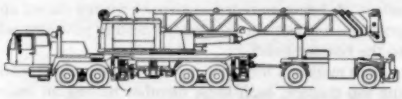
and forming means for controlling peel resistance of said peelable bond.

4,165,005

METHOD AND APPARATUS FOR THE INSTALLATION OF THE SUPPORT ELEMENT OF A CRANE

Olli Jokinen, Tampere, Finland, assignor to Rauma-Repola Oy, Tampere, Finland

Filed May 2, 1977, Ser. No. 792,999
Claims priority, application Finland, May 6, 1976, 761269
Int. Cl.[2] B66C *23/62*
U.S. Cl. 212—145 **21 Claims**



1. Apparatus for raising and lowering a support element with respect to a wheeled vehicle such as a crane, comprising:

a wheeled vehicle having a frame member;

a vehicle support element having at least one extensible member, and having means for selectively supporting a portion of the weight of said wheeled vehicle;

means for extending the extensible member with respect to the support element;

suspension means for connecting the vehicle support element to the frame member, the suspension means being operatively connected both to the frame member and to the at least one extensible member, whereby extension of the extensible member causes the vehicle support element to move vertically with respect to the frame member, the vehicle support element being suspendable relative to the wheeled vehicle solely by the suspension means; and,

fastening means for releasably attaching the vehicle support element to the frame member independently of the suspension means.

15. A method of raising and lowering a support element, which is selectively operable to support a portion of the weight of a wheeled vehicle, with respect to said wheeled vehicle such as a crane, comprising the steps of:

fastening said support element to said wheeled vehicle;

operatively connecting at least one suspension member both to a frame member of the wheeled vehicle and to an extensible member of the support element whereby extension of the extensible member relative to the support element results in a vertical movement of the support element relative to the frame;

extending the extensible member relative to the support element to thereby move the support element vertically with respect to the frame;

unfastening said support element from said wheeled vehicle; and,

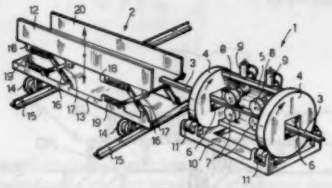
suspending and lowering the support element relative to the frame member of the wheeled vehicle entirely by said at least one suspension member.

4,165,006

APPARATUS FOR GROUPING INTO BUNDLES ELONGATED OBJECTS, MORE PARTICULARLY SECTIONS OR FLAT ROLLED ELEMENTS

Ugo Brusa, Via Vagna, Domodossola, Italy

Filed Dec. 20, 1977, Ser. No. 862,391
Claims priority, application Italy, Dec. 22, 1976, 70062 A/76
Int. Cl.[2] B65G *57/18*
U.S. Cl. 414—63 **5 Claims**



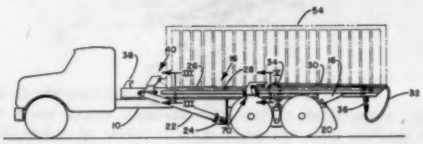
1. Apparatus for grouping elongated objects having longitudinal axes, particularly sections or flat rolled elements, into bundles, said apparatus comprising, a dragging member including means to individually drag the objects to be grouped in an axial direction and into a bundle and means to suitably orient said objects by individually rotating them in a controlled and predictable manner about said axes while dragging them in an axial direction, a bundle-forming carriage including means to receive the objects delivered by the dragging member onto a surface of said carriage, means for changing the level of said surface above the ground to allow the objects to be piled and means for moving said carriage transversely to the dragging direction of the objects to allow the objects to be placed side by side on said surface.

4,165,007

APPARATUS FOR SECURING REMOVABLE CONTAINERS TO VEHICLE PLATFORMS

Douglas S. Brown, Knoxville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,057
Int. Cl.[2] B65J *1/22*
U.S. Cl. 414—494 **5 Claims**



1. In a vehicle of the type used to load and transport individual containers of various sizes by pivoting a longitudinally extending tilting frame upward about the rear of the vehicle, drawing a container onto the frame along guide rails which limit container movement transverse to the tilting frame, and pivoting the tilting frame downward whereby the container rests on the tilting frame, apparatus for securing containers to the tilting frame including,

a securing member for engaging a container resting on the tilting frame and limiting container movement longitudinally along the tilting frame,

means for pivotally connecting the securing member to the tilting frame for movement transverse thereto between an inoperative position, wherein the securing member is below the top of the tilting frame so that the securing

member does not interfere with the loading, transporting, and unloading of a container, and an operative position, wherein the securing member extends above the top of the tilting frame for engagement with a container resting on the tilting frame, and

locking means for locking the securing member into the operative position, including

a lock bar connected to the securing member for movement between a locked position and an unlocked position wherein the securing member is movable transverse to the tilting frame, the lock bar being connected to the securing member so that when the securing member is in the operative position, the lock bar will swing downward by its own weight into the locked position, and

means for engaging the lock bar when the lock bar is in the locked position wherein contact between the lock bar and the engaging means prevents movement of the securing member transverse to the tilting frame.

4,165,008

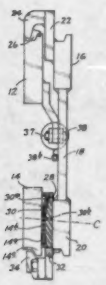
SLIDER ROLLER SIDE SHIFTER FOR USE ON A FORKLIFT TRUCK

Donald M. Faust, Gresham, and Harry F. Weinert, Portland, both of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 638,079, Dec. 5, 1975. This application Aug. 1, 1977, Ser. No. 820,454

Int. Cl.[2] B66F *9/06*

U.S. Cl. 414—750 **5 Claims**



1. A side shifter adapted for mounting upon the front of a vertically movable lift truck carriage, of the type having a transverse mounting member adjacent the top of the carriage and a transverse forwardly-facing surface below said transverse mounting member, for mounting a load-handling attachment upon the carriage with the side shifter interposed structurally between the carriage and attachment so that the attachment is transversely movable with respect to the carriage, said side shifter comprising:

(a) forwardly-facing front mounting means for mounting the load-handling attachment thereon;

(b) first rearwardly-facing mounting means connected to said front mounting means for movably engaging the transverse mounting member of said carriage so as to vertically support said front mounting means and permit said front mounting means to move transversely with respect to said carriage;

(c) second rearwardly-facing mounting means connected to said front mounting means, at a location below said first rearwardly-facing mounting means, for movably engaging the forwardly-facing surface of said carriage, said second rearwardly-facing mounting means comprising a substantially disc-shaped bearing having means defining a rearwardly-facing, generally spherical convex bearing surface on one side thereof for rollingly contacting the forwardly-facing surface of said carriage and having means defining a forwardly-facing surface on the side thereof opposite said convex bearing surface; and

(d) bearing mounting means on said front mounting means, for rotatably mounting said disc-shaped bearing upon said front mounting means, comprising rearwardly-facing surface means for rotatably engaging said forwardly-facing surface of said disc-shaped bearing over an area substantially coextensive with said convex surface of said bearing so as to transmit forces from said front mounting means through said area toward the forwardly-facing surface of said carriage said bearing mounting means including means for requiring said bearing to rotate about an axis of rotation which is inclined upwardly in a direction from front to rear.

4,165,009

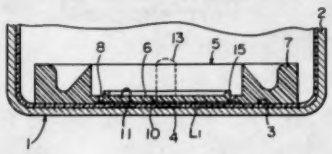
BOTTLE CLOSURE FOR SALES PROMOTION

Kashiwa Murayama, Fujisawa, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1978, Ser. No. 868,874

Int. Cl.[2] B65D *55/00*

U.S. Cl. 215—230 **10 Claims**



1. A closure for sales promotion comprising:

a closure shell having an inner bottom surface;

an indication of a prize offer positioned adjacent said inner bottom surface; and

a sealing gasket including a peripheral sealing portion firmly adhered to said inner bottom surface and a central panel portion removably positioned on said inner bottom surface and separated from said peripheral sealing portion by a breakable line, such that said central panel portion can be stripped from said inner bottom surface while leaving said peripheral sealing portion firmly adhered thereto.

4,165,010

ELECTRICAL OUTLET BOX

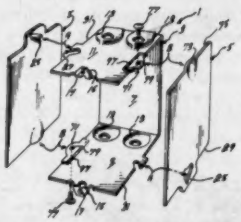
William Nattel, Montreal, Canada, assignor to GTE Sylvania Canada Limited, Montreal, Canada

Filed Jan. 24, 1977, Ser. No. 761,473

Claims priority, application Canada, Dec. 17, 1976, 268114

Int. Cl.[2] H02G *3/08*

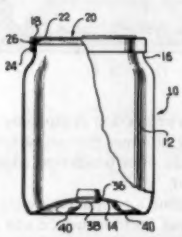
U.S. Cl. 220—3.94 **3 Claims**



1. An electrical outlet box comprising a spacer member and two side walls; the spacer member having a back wall and a pair of end walls; first connecting means for connecting one end of each side wall to an end wall; second connecting means for connecting the other end of each side wall to the opposite end wall; said first connecting means comprising first and second cooperating means on the side wall and end wall respectively for wedging the side wall against the end wall as the

side wall is relative to the spacer member about the first connecting means and in the plane of the side wall from a first initial mounting position where the side wall is at a slight angle to the spacer member, to a second final mounting position where the side wall is square with the spacer member and closes an open side; the first cooperating means comprising an opening in the side wall and a first wedging surface on the side wall defining the opening and facing toward the one end of, each side wall; the second cooperating means comprising a projection on the end wall insertable through the opening, the projection having a second wedging camming surface facing inwardly toward the edge of the end wall which is in contact with the sidewall.

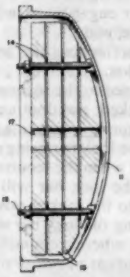
4,165,011
BONDED CAN TOP
Albert J. Holk, Jr., Frankfort, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Sep. 9, 1977, Ser. No. 831,981
Int. Cl.[2] B65D *7/42*
U.S. Cl. 220—67 **6 Claims**



1. In a container, a metal container body having an end portion terminating in a terminal cut raw edge defining an open end of said body, and an end unit closing said body open end, said end unit being cup-shaped and including a generally planar end wall and a skirt directly intersecting in a substantially right angular peripheral corner, said skirt having an internal diameter materially greater than the external diameter of said container body end portion, a continuous band of adhesive being generally triangular in cross section and being disposed on an inner surface of said skirt and extending into said peripheral corner and on a portion of said end wall, said adhesive engaging two only adjacent surfaces of said end unit, and said body end portion being telescoped within said end unit with said terminal cut raw edge being embedded in said band, and said band being of sufficient axial thickness and radial width t provide positive spacing between said body end portion and both said end unit end wall and skirt while forming a seal therebetween.

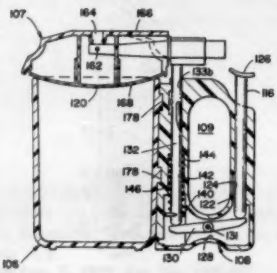
4,165,012
FILLER FOR PRESSURE VESSEL
Robert E. Markwood, Chester, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 7, 1977, Ser. No. 858,230
Int. Cl.[2] B65D *7/42*
U.S. Cl. 220—71 **6 Claims**

1. In a vessel for holding fluid under pressure, having an interior working space and having an exterior wall of the vessel defining a curved surface, an assembly for filling an interior portion of the vessel adjacent said surface, comprising a plurality of individual metal plates stacked together in parallel, slightly spaced relationship, said plates being relatively thicker than the spaces between them so as to occupy substantially all of said interior portion in which they are located



thereby reducing the volume of fluid needed to fill the working space of said vessel.

4,165,013
COVERED CUP
Timothy J. Lutz, 116 Warwick Dr., Walnut Creek, Calif. 94598
Continuation-in-part of Ser. No. 822,722, Aug. 8, 1977, abandoned. This application Apr. 28, 1978, Ser. No. 900,912
Int. Cl.[2] A47G *19/22*; B65D *43/26, 43/16*
U.S. Cl. 220—215 **9 Claims**

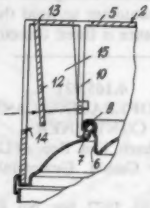


1. A cup comprising:
a cup member;
a handle affixed to said cup member;
cover means for covering said cup;
rotating means cooperating with and disposed within said handle and responsive to manual pressure for raising and rotating said cover means so that said cup is uncovered;
said rotating means having a portion extending upwardly above said handle;
a socket connection between said cover means and said rotating means;
said cover means comprising a cover and an arm member, said arm member having one end pivotally affixed to said cover generally at the midpoint of said cover and extending radially therefrom beyond said cover, said arm member detachably affixed to said socket connection at the other end of said arm member.

4,165,014
CAPS HAVING FRANGIBLE OPENING MEANS
Tomaso Ruscitti, Via Amedeo d'Aosta 11, Milan, Italy
Filed Feb. 14, 1978, Ser. No. 877,685
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—266 **2 Claims**

1. Improvements in or relating to caps for containers, particularly aerosol containers, of the type comprising inner and outer skirt portions concentrically depending from a top disc

member, wherein said inner skirt portion is attached to the container through lugs, said inner skirt portion having a longitudinal discontinuity and a bridge-like member transversing



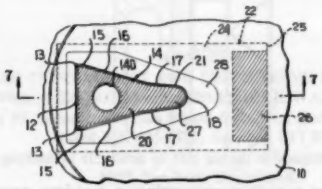
said discontinuity, said bridge-like member being breakable by rotation of a tab, which is an integral part of the cap and is joined at one end to said outer skirt portion by a readily breakable area.

4,165,015

LANCED SCORED AND PUNCHED EASY OPENING PANEL ARRANGEMENTS

Gary K. Hasegawa, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,955
Int. Cl.² B65D *41/32*
U.S. Cl. 220—269 **25 Claims**



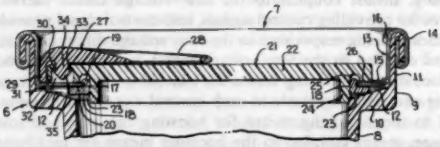
1. An easy opening container arrangement comprising a container panel, a removable panel portion defined in said container panel by the combination of at least one cut line and at least one score line, said cut line defining an initially opening part of said removable panel portion, a pull tape overlying a part of said container panel including said removable panel portion, said pull tape having a peelable bond with said container panel surrounding said removable panel portion and a permanent bond with said removable panel portion, said pull tape further having a permanent bond with said container panel adjacent said removable panel portion and remote from said cut line.

4,165,016

EASY OPEN RECLOSABLE END UNIT

Jens L. Moller, Darien, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jul. 12, 1978, Ser. No. 923,887
Int. Cl.² B65D *41/32*
U.S. Cl. 220—270 **14 Claims**



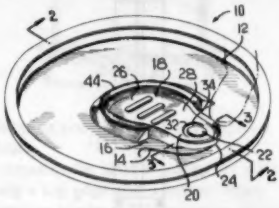
1. An easy opening end unit comprising an end panel, peripheral seam forming means on said end panel for securing said end panel to a container body, a dispensing opening in said end panel, a closure element overlying said dispensing opening and engaging said end panel peripherally around said dispensing opening, a rupturable seal between said closure element and said end panel, and cam means carried by said closure element and engageable with said end panel radially outwardly of said rupturable seal for effecting rupture of said seal and the removal of said closure.

4,165,017

CHILD RESISTANT PULL TAB

Gary K. Hasegawa, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 29, 1978, Ser. No. 947,297
Int. Cl.² B65D *41/32*
U.S. Cl. 220—273 **8 Claims**



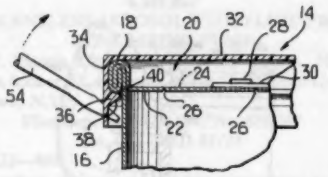
1. A child resistant easy opening container comprising a container panel and a pull tab, said container panel having an outer surface, said pull tab including a tab body having an intermediate securing portion attached to said container panel, and a nose portion and lift portion at opposite ends thereof, said tab body having an underside lying in a general plane substantially coplanar with a major portion of said container panel outer surface, a peripheral hem around said tab body at least generally from said securing portion and around said lift portion, said hem having an outer lower edge substantially continuously touching said container panel outer surface and defining means for resisting initial lifting of said lift portion to actuate said pull tab.

4,165,018

CHILD RESISTANT OVERCAP FOR EASY OPENING CONTAINER

Earl D. Giggard, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,621
Int. Cl.² B65D *43/26*
U.S. Cl. 220—284 **9 Claims**



1. A child resistant overcap for use with containers having a peripheral projection, said overcap comprising an end panel having a continuous depending peripheral skirt, locking means on said skirt for snap interlocking engagement with a container peripheral projection to retain said overcap against removal, said skirt having a rupturable section defined by at least two weakening lines, and a tool receiving opening in said rupturable section for receiving a tool to effect rupture of said skirt along said weakening lines, said skirt having a free lower edge and at least one of said weakening lines extending generally in

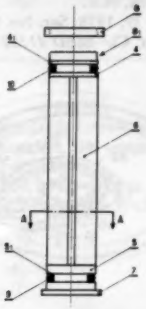
the height direction of said skirt and at least substantially to said skirt free lower edge.

4,165,019

TANK FOR FLUIDS UNDER PRESSURE

Philippe Holder, Marnaz (Haute Savoie), France

Continuation-in-part of Ser. No. 719,521, Sep. 1, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,220
Claims priority, application France, Sep. 2, 1975, 75 26934
Int. Cl.² B65D *41/04*
U.S. Cl. 220—288 **5 Claims**



1. A tank for storage of fluids under pressure comprising in combination,

(a) a cylindrical body open at both ends,

(b) said cylindrical body covered with a fibrous winding around the periphery thereof,

(c) two caps having a diameter equal to the interior diameter of the cylinder,

(d) said caps spaced apart the distance of the length of the cylinder and held in position by a stay rod integral with both caps,

(e) two pads having a diameter at least equal to the outside diameter of said cylinder.

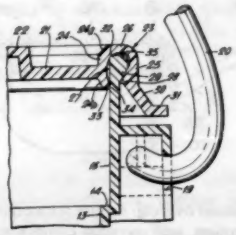
(f) said pads attached in axial alignment to the outer side of said caps.

4,165,020

CLOSURES AND CONTAINER ASSEMBLIES

Harry Hoselton, Wheeling, W. Va., assignor to Polysar Resins, Inc., Leominister, Mass.

Filed Jul. 17, 1978, Ser. No. 925,167
Int. Cl.² B65D *41/16*
U.S. Cl. 220—306 **6 Claims**



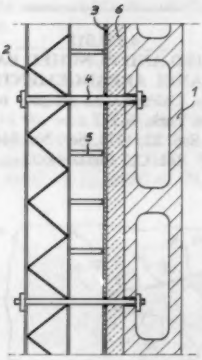
1. A plastic closure for a container comprising a closure portion and an annular rim surrounding the closure portion, the rim being of inverted U-shape and having radially spaced inner and outer axially extending walls which are joined by a base and defined a downwardly facing annular recess, the inner wall having a portion extending upwardly from the closure portion to the base and a resiliently flexible portion extending downwardly from the closure portion to terminate in a free end, the two portions having outer surfaces which increase in diameter as they extend from the closure portion, and the outer wall having a locking means facing into the recess to engage the annular wall of a container to hold the closure upon the container when the closure is fitted thereto.

4,165,021

HOT OR COLD OPERATING CAST PRESSURE CONTAINER

Rolf Dörling, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Sep. 21, 1977, Ser. No. 835,045
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2643011
Int. Cl.² B65D *7/42, 25/18*
U.S. Cl. 220—468 **7 Claims**



1. A pressure container comprising: a cast-iron container having an inner wall, a steel lining fixed inside said inner wall, means inside said lining to protect the lining and for stabilizing said lining against deformation and denting, said means being in the form of a framework spaced from said lining, spaced individual anchoring elements extending through said framework and said lining and connecting said framework to said container, and spacer elements fixed to said framework for spacing said framework from said steel lining, while closely abutting said steel lining.

4,165,022

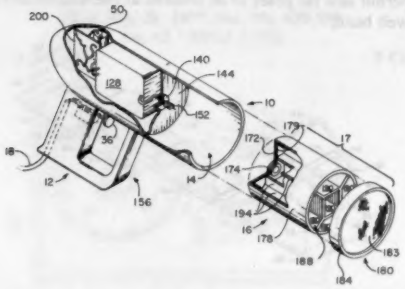
HAND-HELD COATING-DISPENSING APPARATUS

Stanley L. Bentley, and David G. Jessup, both of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Mar. 2, 1977, Ser. No. 773,520
Int. Cl.² B05B *5/02*
U.S. Cl. 222—76 **15 Claims**

1. An electrostatic coating-dispensing apparatus comprising a hand-held housing, means for supplying coating to be dispensed to the housing, a source of low voltage direct current, the low voltage direct current source being housed in the housing, means coupled to the low voltage direct current source for providing control signals, said control signal providing means being responsive to the low voltage direct current, means coupled to the low voltage direct current source and control signal providing means for switching the low voltage direct current in response to such control signals, means coupled to the switching means for boosting the switched low voltage, means coupled to the boosting means for rectifying the boosted voltage, an electrode coupled to the rectifying means for supplying the rectified and boosted voltage to the coating to be dispensed, and means for supplying alternating current line voltage to the housing, the line voltage supply

means being coupled to the low voltage direct current source, the means for supplying coating to be dispensed comprising an interchangeable cartridge engageable with the electrode to



define a self-contained dispenser for the particles of coating, said cartridge having an end wall adjacent said electrode and said end wall including a semi-conductive material portion to transmit charge from said electrode to the particles of coating.

4,165,023

FLUID CONTAINING AND DISPENSING STRUCTURE HAVING A DEFORMABLE FLEXIBLE WALL PORTION

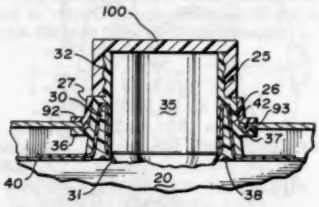
Justin M. Schmit, 126 Sea Island La., Boca Raton, Fla. 33432

Filed Jul. 21, 1977, Ser. No. 817,816

The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.

Int. Cl.[2] B67B *7/28*

U.S. Cl. 222—105 **19 Claims**



1. A container comprising: a fluid containing pouch having at least one flexible upper wall portion; a dispensing neck with a dispensing aperture extending therethrough positioned on one side of said flexible wall portion and connected thereto, said dispensing neck having an annular tapered recess surrounding said dispensing aperture at one end thereof and adjacent said flexible wall portion and a closure receiving surface on the other end thereof; a wedging collar having a corresponding tapered external surface positioned on the other side of the flexible wall portion and wedged into said annular recess of said dispensing neck with the flexible wall portion fixedly wedged therebetween and deformed around said collar in said recess so as to minimize any possible leakage path through the flexible upper wall portion around the dispensing neck, said flexible wall portion having an aperture therein communicating with the aperture in the dispensing neck, and an integral flange portion positioned on said dispensing neck and extending transversely to the aperture in said neck for mounting the pouch.

4,165,024

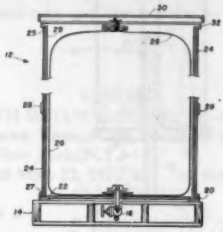
BULK SHIPPING CONTAINER

Leon M. Oswalt, Guthrie, and Jimmie D. McClanahan, Oklahoma City, both of Okla., assignors to Cato Oil and Grease Co., Oklahoma City, Okla.

Filed Sep. 9, 1977, Ser. No. 831,867

Int. Cl.[2] B65D *77/06*

U.S. Cl. 222—105 **5 Claims**



1. A bulk shipping container which comprises:

a base structure;

a side wall structure, at least a portion of which is removable, having a top edge and a bottom edge;

a side wall retainer structure located upon the base structure, said retainer structure adapted to receive the bottom edge of said side wall structure;

a disposable inner liner located within said side wall structure;

a drain conduit and flow regulation valve assembly positioned such that one end of said conduit is in sealed engagement with the interior of the disposable inner liner such that a product material to be contained therein can be removed therefrom;

a top cover structure removably mounted upon the top edge of the side wall structure to seal the container;

a liner support bar positioned in such manner as to extend substantially across the top of the side wall structure beneath the top cover structure to support the disposable inner liner; and

means for removably securing the assembled top cover structure, side wall structure and side wall retainer structure to the base structure.

4,165,025

PROPELLANTLESS AEROSOL WITH FLUID PRESSURE GENERATING PUMP

Carmen T. Mascia, Clarendon Hills, and Gary K. Hawegawa, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

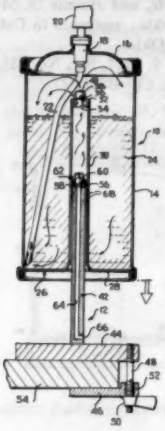
Filed Sep. 21, 1977, Ser. No. 835,347

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—401 **2 Claims**

1. A product dispensing assembly comprising a container and a separately formed pump piston, support means connected to said pump piston for fixedly mounting said pump piston to a supporting object entirely independently of said container, said container being in the form of a can including a body having a top closure wall and carrying a dispensing valve, said can further including a separately formed bottom end unit secured to said body by a peripheral seam and including an end panel having an inlet opening therethrough, a cylinder of a size for cooperation with said independently fixed mounted pump piston, said cylinder being disposed internally of said can and being secured to said end panel surrounding

said inlet opening, said support means including a base plate, and clamp means carried by said base plate for clamping said



base plate to a support structure, said pump piston being fixedly secured to said base plate.

4,165,026

TUNDISH WITH EXPENDABLE LINING AND EASILY REMOVABLE NOZZLE

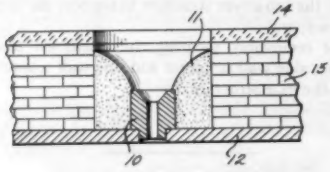
Ian J. Hazlehurst, and David C. Willard, both of Guelph, Canada, assignors to Foseco Trading A.G., Chur, Switzerland

Division of Ser. No. 789,943, Apr. 22, 1977, which is a continuation of Ser. No. 312,274, Dec. 5, 1972, abandoned. This application Mar. 24, 1978, Ser. No. 889,843

Claims priority, application United Kingdom, Dec. 7, 1971, 56878/71; Oct. 19, 1972, 48249/72

Int. Cl.[2] B22D *41/02*

U.S. Cl. 222—591 **9 Claims**



1. A tundish consisting essentially of an outer metal casing, a permanent lining of refractory material adjacent the casing, an expendable lining made up of a set of slabs of refractory heat insulating material, and at least one nozzle including a highly refractory nozzle ring set into the base of the tundish by means of a sealing compound which remains unhardened during the use of the tundish for continuous casting of molten metal.

4,165,027

SKI AND SKI POLE ASSEMBLY

Robert W. Briggs, 10421 Prado Woods, Villa Park, Calif. 92667

Filed Feb. 21, 1978, Ser. No. 879,125

Int. Cl.[2] B65D *71/00*

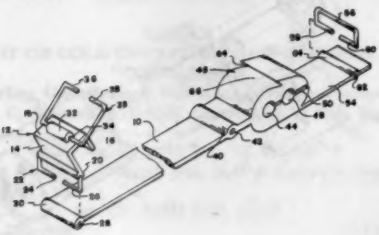
U.S. Cl. 224—45 S **8 Claims**

1. A retainer for an assembly of a pair of skis and ski poles which comprises:

(a) a continuous first web band for encircling a pair of skis in bottom-to-bottom array;

(b) securing means to secure said first web band in encirclement about said pair of skis;

(c) an integrally formed clamp block carried at one end of said first web band and comprising a block having a pair of parallel, coextensive through bores bearing an end slit opposite said first web band, parallel to and intersecting said through bores to receive said ski poles and thereby permit said ski poles to be secured at one end of said first web band;



(d) lock means comprising a second, integrally formed web band secured at one end to said clamp block to overlie said slit and a web band retainer means to secure said second web band in overlay of said slit, to secure said ski poles in said clamp block in parallel alignment to said pair of skis.

4,165,028

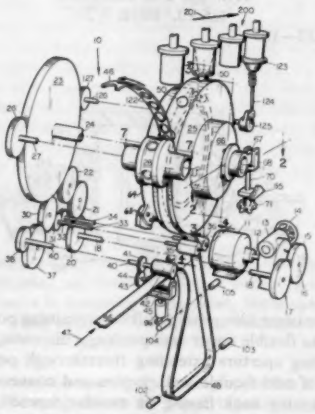
METHOD FOR CONTROLLING A WEB OF MATERIAL

Thomas E. Doherty, Setauket, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 768,245, Feb. 14, 1977. This application Nov. 25, 1977, Ser. No. 854,579

Int. Cl.[2] B65H *23/22*

U.S. Cl. 226—4 **2 Claims**



1. The method of maintaining a festoon of web material including the steps of;

(a) advancing a web of material into said festoon from a first side,

(b) stopping the movement of web material into said festoon from said first side,

(c) withdrawing web material from said festoon from a second side,

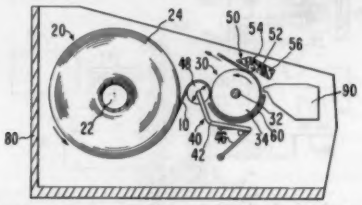
(d) stopping the withdrawal of the web material from said second side, and

(e) returning some of said withdrawn web of material to said festoon from said second side on an intermittent basis.

4,165,029
PAPER ADVANCE MECHANISM FOR AN INK JET PRINTER

Charles S. Mitchell, Palo Alto, Calif., assignor to Silonics, Inc., Sunnyvale, Calif.

Filed Sep. 28, 1977, Ser. No. 837,555
Int. Cl.[2] B65H 17/22
U.S. Cl. 226—25 7 Claims



1. An apparatus for positioning and advancing a recording web for non-impact printing, comprising:

means for holding a recording web in a manner that the web can be pulled therefrom in a preferred direction with some retarding force,

a cylinder held to be rotatable about a center axis perpendicular to said preferred direction, said cylinder having a portion along its length generally in its middle that has a coefficient of friction that is at least several times higher than that of remaining cylinder portions,

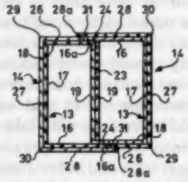
means resiliently urged against said cylinder in a position with respect to said cylinder and said web holding means for guiding said web in contact with said cylinder in a manner that said means withdraws from the cylinder in response to a sufficient tension on the web as the web is advanced, whereby tension is reduced and a constant tension is maintained on the web around the cylinder, and

means urged against the cylinder for increasing the frictional engagement of the web with said high friction cylinder surface portion, said frictional increase means being placed at a position to contact the web after it has passed said guiding means, whereby sufficient force is applied to the web in response to the rotation of the cylinder to withdraw the web from its holding means.

4,165,030
TWO CELL BULK BOX

Arthur W. Bunger, Savannah, Ga., and Thorne C. Kitchell, Spartanburg, S.C., assignors to Union Camp Corporation, Wayne, N.J.

Filed Jun. 19, 1978, Ser. No. 916,512
Int. Cl.[2] B65D 3/24, 5/48
U.S. Cl. 229—15 4 Claims



1. A two cell bulk box body comprising:

a pair of tubes positioned adjacent to each other each formed from four serially interconnected panels to provide first side, end, second side, and center inner walls;

the center inner walls of the tubes being interlocked and bonded inside face to inside face to provide a center strut for the box;

the first side wall of each tube having an extended end which overlaps and is bonded to the second side wall of the other tube and over the end of the said strut;

a pair of members each encasing a tube and formed from three serially interconnected panels to provide first side, end, and second side outer walls;

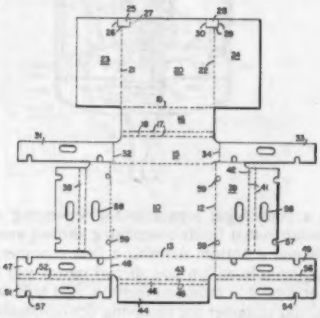
the first side wall of each member having its end meeting the extended end of the first wall of the opposite inner tube;

the second side wall of each member having an extended end which overlaps and is bonded over the said meeting ends of the encased tube and the opposite member.

4,165,031
SHORT DEPTH RETURNABLE BOTTLE CONTAINER

Edward L. Osborne, Kansas City, Kans., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 22, 1978, Ser. No. 888,835
Int. Cl.[2] B65D 5/22
U.S. Cl. 229—34 R 4 Claims



1. A returnable bottle container prepared from a single blank of corrugated paperboard or the like and having an open top comprising:

(a) a pair of spaced and parallel end walls, formed by a pair of panels foldably attached to each end of a first bottom panel, a second pair of panels foldably attached to the free ends of a side wall panel at one side of said first bottom panel and a single panel foldably attached to the free ends of a side wall panel at the other side of said first bottom panel, said end wall panels each containing a hand hole cut out and drainage openings, the plurality of which become superimposed upon one another at each end of the container when the panels are folded, wherein each of said end walls comprise a plurality of panels amounting to five thicknesses of paperboard;

(b) a pair of spaced and parallel side walls, formed by a pair of side wall panels foldably attached to each side of said first bottom panel, each of said side walls comprising a plurality of panels amounting to two thicknesses of paperboard;

(c) a plurality of shoulder panels, foldably attached between each pair of side wall panels, each pair of end wall panels foldably attached to the ends of said first bottom panel, and each pair of end wall panels foldably attached to the free ends of a side wall panel at one side of said first bottom panel;

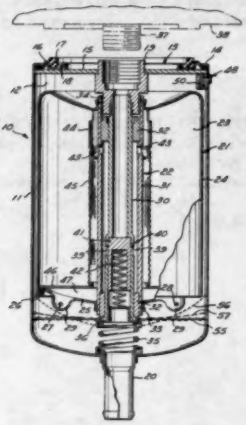
(d) a bottom wall comprising a plurality of panels amounting to three thicknesses of paperboard; and,

(e) a reinforcing member in the form of a wire rim insert corresponding generally in size and configuration to the open top of the container positioned around the perimeter of the open top of said container in the vicinity of said shoulder panels.

4,165,032
DISPOSABLE CENTRIFUGAL SEPARATOR WITH BAFFLE MEANS

James C. Klingenberg, Painesville, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Jun. 17, 1977, Ser. No. 807,388
Int. Cl.[2] B04B 9/00
U.S. Cl. 233—23 R 7 Claims



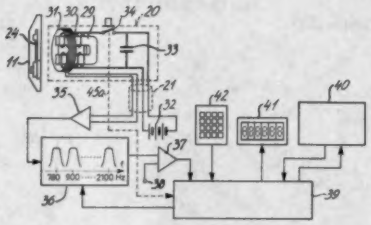
1. In a centrifugal separator for separating contaminants from contaminated fluids comprising shroud means including sidewalls and a bottom defining a first chamber, a vertically extending spindle within said shroud means and having a hollow rotor rotatably mounted thereon, said hollow rotor defining a second chamber for receiving contaminated fluids to be separated, passage means through said spindle to said second chamber, means to rotate said rotor about a vertical axis and thereby cause contaminants in contaminated fluids within said second chamber to migrate toward a sidewall of said second chamber under the influence of centrifugal force and to be separated from such contaminated fluids, said means to rotate said rotor comprising tangentially mounted outlet port means on said rotor in fluid communication with said second chamber and traveling in a circular path about said vertical axis to cause said rotor to rotate upon discharge of fluid from said second chamber to said first chamber, and outlet port means from said first chamber, in combination therewith the improvement wherein said outlet port means from said first chamber is disposed generally on the axis of the rotor at the bottom of said shroud means, said outlet port means from the first chamber being relatively small in relation to the size of the shroud means bottom, said shroud means bottom extending from said sidewalls generally radially inwardly substantially within a radial zone defined by said circular path of said tangentially mounted outlet port means to said outlet port means from the first chamber, and baffle means between said tangentially mounted outlet port means and the outlet port means from the first chamber to dissipate the buildup of fluid on the inner sidewalls and bottom of the first chamber which would tend to interfere with the rotation of the rotor.

4,165,033
IDENTIFICATION SYSTEM

Holger Nielsen, Allerød, and Per Salling, Birkerød, both of Denmark, assignors to A/S N. Foss Electric, Hillerod, Denmark

Filed Apr. 25, 1979, Ser. No. 899,994
Claims priority, application Denmark, Apr. 26, 1977, 1820/77
Int. Cl.[2] G06K 7/00, 7/08, 19/06; G01S 9/56
U.S. Cl. 235—439 20 Claims

16. A cow identification system comprising a plurality of differently frequency coded identification tags adapted to be fastened to cows, a frequency detecting device associated with a milk sampling device for detecting and registering the frequency codes of said tags, and means for generating a magnetic field at a tag being detected, each identification tag including at

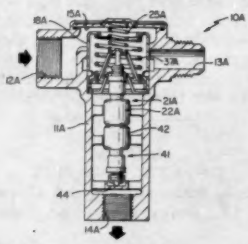


least one mechanical vibrating member having a certain natural frequency, and including ferro-magnetic material, and said detecting device including means for detecting vibrating changes in said magnetic field caused by said mechanical vibrating member.

4,165,034
FLUID MIXING VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Arden D. Rogers, Jr., and Clifford E. Goff, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 736,763, Oct. 29, 1976, Pat. No. 4,082,219.
This application Jan. 25, 1978, Ser. No. 872,065
Int. Cl.[2] G05D 23/12
U.S. Cl. 236—12 R 4 Claims

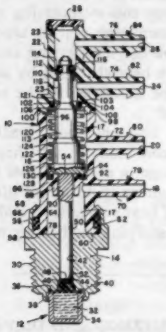


1. In a fluid mixing valve construction having a housing means provided with a pair of inlets respectively interconnected by a pair of valve seats to an outlet and with valve member means operated by condition responsive means for controlling said valve seats in accordance with the condition of the fluid passing to said outlet and sensed by said condition responsive means, a second condition responsive means being operatively interconnected to said valve member means to close one of said valve seats with said valve member means if the first-mentioned condition responsive means does not close the one valve seat with said valve member means even though the same is sensing a condition that would require the same to close said one valve seat, the improvement wherein said second condition responsive means acts directly on said first-mentioned condition responsive means to move said first-mentioned condition responsive means and said valve member means relative to said housing means to close said one valve seat if said first-mentioned condition responsive means does not close said one valve seat with said valve member means even though the same is sensing a condition that would require the same to close said one valve seat.

4,165,035
THERMALLY ACTUATED VALVE FOR PLURAL FLUID SOURCES

Edgar W. Maltby, Elgin, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 5, 1977, Ser. No. 839,723
Int. Cl.[2] G05D *23/12*
U.S. Cl. 236—86 13 Claims



1. A thermally responsive device for valving a plurality of fluid ports, comprising:

(a) a housing means defining a fluid chamber, said housing means further defining first, second, third and fourth spaced fluid ports communicating with said fluid chamber;

(b) valve means disposed within said fluid chamber, said valve means including:

(i) means defining a first valve sealing surface in said housing means;

(ii) means defining a second valve sealing surface in said housing means and spaced from said first valve sealing surface, said second valve sealing surface comprising a resilient annular member mounted in said housing means;

(iii) means defining a third valve sealing surface in said housing means and spaced from said second and first sealing surfaces; and

(iv) a valve member disposed within said fluid chamber, said valve member being movable between a first and second position and having first, second, and third spaced seal means, thereon, said second seal means on said valve member includes means defining an annular surface for contacting the inner periphery of said second annular member and maintaining said sealing thereagainst during movement of said valve member in said second position, in which first position said first seal means seals against said first valve sealing surface for isolating said first and second fluid ports from each other, said second seal means is spaced from said second valve sealing surface for communicating said second fluid port with said third fluid port, and said third seal means seals against said third valve sealing surface for isolating said fourth fluid port from said third fluid port, and in said second position said first seal means is spaced from said first valve sealing surface for communicating said first fluid port with said second fluid port, said second seal means seals against said second valve seat for isolating said second fluid port from said third fluid port, and said third seal means is spaced from said third valve sealing surface for communicating said third fluid port with said fourth fluid port;

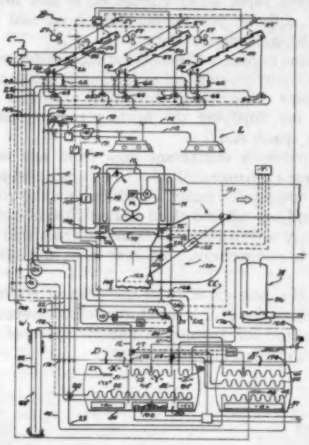
(c) means biasing said valve member to said first position; and

(c) thermally responsive means associated with said housing means and including means operative to move said valve member between said first and second positions in response to predetermined temperatures.

4,165,036
MULTI SOURCE HEAT PUMP AIR CONDITIONING SYSTEM

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343

Filed Aug. 29, 1977, Ser. No. 828,773
Int. Cl.[2] G05D *23/00*
U.S. Cl. 237—1 A 20 Claims



1. A multi source environmentally assisted air conditioning system wherein at least one water source mechanical refrigeration heat pump is operable to condition and to discharge return air from and into a zone to be air conditioned, and including; a convertible heat exchange means alternately operable for the collection of solar heat into a first liquid heat transfer media and for the radiation of internal heat from a second liquid heat transfer media, a thermal mass of high heat range and a thermal mass of low heat range, there being pump means circulating the liquid heat transfer media separately from the thermal mass of high heat range and from the thermal mass of low heat range respectively, and valve means for selective closed loop circulation of said liquid heat transfer media through the convertible heat exchange means and through either the thermal mass of high heat range or the thermal mass of low heat range, and there being water source pump means circulating the liquid heat transfer media separately for said closed loop circulation from the thermal mass of high heat range and from the thermal mass of low heat range and through heat exchanging means of the said water source mechanical refrigeration heat pump.

4,165,037
APPARATUS AND METHOD FOR COMBINED SOLAR AND HEAT PUMP HEATING AND COOLING SYSTEM

Donald M. McCarson, Rte. 1, Box 143, Pisgah Forest, N.C. 28768

Filed Jun. 21, 1976, Ser. No. 697,941
Int. Cl.[2] F25B *13/00, 25/00;* F24J *3/02*
U.S. Cl. 237—1 A 27 Claims

1. A heating system for delivering heat to the interior space of a building structure comprising:

a first heat exchange coil disposed in heat exchange relationship with said interior space;

a second heat exchange coil in heat exchange relationship with a main heat source;

a fluid refrigerant line connecting said first and second heat exchange coils having a fluid refrigerant contained therein;

a compressor means connected in said refrigerant line between said first and second heat exchange coils having a suction side and a discharge side for compressing said refrigerant;

a third heat exchange coil connected in a parallel flow relationship with said second heat exchange coil in a parallel refrigerant line and in a series flow relationship with said compressor means, said third heat exchange coil being in heat exchange relationship with an auxiliary heat source;

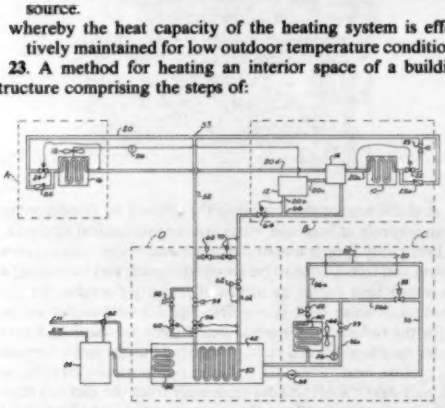
expansion means connected in said refrigerant line for evaporating refrigerant in said second heat exchange coil, said refrigerant vapor being condensed in said first heat exchange coil for transferring heat from said main heat source to said interior space;

valve means connected in said parallel refrigerant line for selectively by-passing and expanding at least a part of said refrigerant through said third heat exchange coil as required for satisfying the heating requirements of said interior space; and

means combining refrigerant flow from said second and third heat exchange coil prior to entering said suction side of said compressor means affording regulation of said flow from said second and third heat exchange coils so as to efficiently utilize the heat available from said main heat source in combination with heat from said auxiliary heat source.

whereby the heat capacity of the heating system is effectively maintained for low outdoor temperature conditions.

23. A method for heating an interior space of a building structure comprising the steps of:



(a) providing a solar collector for collecting and absorbing solar radiation and passing a heat transfer fluid in heat exchange relationship with said solar collector for absorbing the radiant heat therefrom to thereby heat said fluid;

(b) transferring heat from said heated fluid to said interior space when the temperature of said fluid is sufficient for satisfying the interior heating requirements;

(c) providing a first heat exchange coil in heat exchange relationship with said interior space and a second heat exchange coil in heat exchange relationship with a main heat source;

(d) providing a refrigerant flow line connecting said first and second heat exchange coils and providing a compressor having a suction side and a discharge side connected in said refrigerant flow line between said first and second coils for compressing a refrigerant contained in said refrigerant flow line;

(e) energizing said compressor when heat is required by said interior space and when the temperature of said heat transfer fluid is insufficient for heating said interior space;

(f) providing expansion means in said refrigerant flow line for expanding and evaporating refrigerant in said second heat exchange coil, said vaporized refrigerant being condensed in said first heat exchange coil for absorbing and transferring heat from said main heat source to said interior space when said compressor is energized;

(g) providing a third exchange heat exchange coil connected in parallel across said second heat exchange coil in a parallel refrigerant line and disposing said third heat exchange coil in heat exchange relationship with an auxiliary heat source;

(h) by-passing at least a part of said refrigerant through said parallel refrigerant line and said third heat exchange coil in response to the heat exchange capacity of said second heat exchange coil being reduced below a predetermined level;

(i) providing an expansion means in said parallel refrigerant line for expanding and evaporating refrigerant through said third heat exchange coil to absorb heat from said auxiliary heat source (transferring said abosrbed heat in combination with heat absorbed by said second heat exchange coil to be delivered to the suction side of said compressor.); and

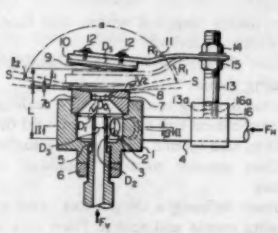
(j) delivering said heat absorbed in said second heat exchange coil in combination with heat absorbed in said third heat exchange in common flow to said suction side of said compressor so as to afford efficient combination and utilization of heat available in said main and auxiliary heat sources in satisfying the heating requirements of said interior space.

4,165,038

DEVICE FOR ATOMIZING AND DISPERSING A FLUID

Toshiharu Kumazawa, Fujisawa, Japan, assignor to Mitsubishi Precision Co., Ltd., Kamakura, Japan

Filed Nov. 30, 1977, Ser. No. 856,128
Claims priority, application Japan, Dec. 3, 1976, 51-144616
Int. Cl.[2] B05B *1/26, 1/34*
U.S. Cl. 239—405 **16 Claims**



1. In a device for atomizing at least one fluid, including a cylindrical fluid barrel having a tangential fluid inlet port, a converging zone at the upper end of said barrel, and a conical fluid outlet with a fluid dispersing round member, wherein the improvement comprises a flexible support structure for holding said fluid dispersing round member so that said fluid dispersing round member is hydrodynamically moved toward said conical fluid outlet by a low pressure created by a high speed turning motion of the fluid in said cylindrical barrel, whereby the fluid is dispersed in the form of a high speed dispersion filmy stream toward the environment surrounding the device.

4,165,039

GAS APPLIANCE RETROFIT ORIFICE

John P. Zielinski, 9724 Laurence Ave., Allen Park, Mich. 48101

Filed Dec. 19, 1977, Ser. No. 862,018
Int. Cl.[2] F23C *5/00*
U.S. Cl. 239—600 **3 Claims**

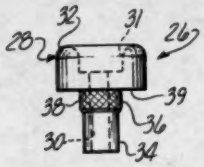
1. For use in conjunction with a gas appliance having a source of gas fluidly connected to burner means via an existing orifice in a manifold means, a retrofit orifice comprising:

an elongated body, said body having an enlarged annular head formed on one axial end thereof;

fluid passage means formed axially through said body, said fluid passage means comprising a throughbore formed axially through said body, said throughbore having an

enlarged diameter portion through the enlarged head of the body whereby distortion of the enlarged head will not fluidly restrict the fluid passage means; and

a cylindrical retention portion on said body axially adjacent said head, said retention portion having a diameter substantially the same or slightly larger than a hole formed in the existing orifice, the exterior surface of the retention



portion being knurled whereby said retrofit orifice is securely attached to the existing orifice by driving said retrofit orifice into said existing orifice hole so that the exterior knurled surface of said retention portion frictionally engages and bites into said existing orifice to thereby fixedly attach said retrofit orifice to said existing orifice and so that said fluid passage means fluidly communicates with said manifold means via the existing orifice.

4,165,040

NOZZLE

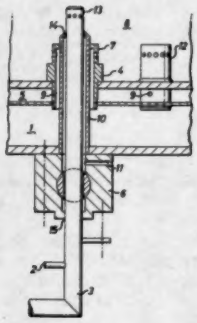
Bryan Beacham, Wokingham, and Gordon W. Sutton, Bisley, both of England, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed Sep. 6, 1977, Ser. No. 830,832

Claims priority, application United Kingdom, Sep. 8, 1976, 37182/76

Int. Cl.² B05B *1/00*

U.S. Cl. 239—600 **10 Claims**



1. A nozzle arrangement for a fluidised bed furnace comprising, in combination: a fuel injection nozzle extending into said furnace; a sleeve surrounding and spaced apart from said fuel injection nozzle at the entry of said nozzle into said furnace; partition means in spaced relation between said fuel injection nozzle and said surrounding sleeve; means mounting said fuel injection nozzle for movement within said partition means; said partition means including means in sealing contact with said nozzle within said furnace; inlet means for supplying a pressurised gas to the space between said partition means and said nozzle, and valve means through which said nozzle may be withdrawn from said furnace while the furnace is under load and the bed is in a fluidised state.

4,165,041

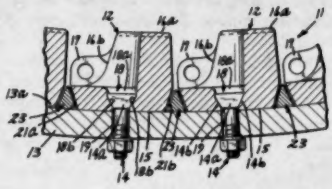
SHELL LINER ASSEMBLY FOR ORE GRINDING MILLS

Darrell R. Larsen, Salt Lake City, Utah, assignor to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.

Filed Feb. 2, 1978, Ser. No. 874,398

Int. Cl.² B02C *17/22*

U.S. Cl. 241—182 **16 Claims**



1. A removable liner assembly for the shell of an ore grinding machine, comprising:

(a) a plurality of liner segments, each of which comprises a segment body defining a mounting surface constructed for mounting engagement with the shell surface and a grinding surface for comminuting the ore, each segment body defining opposite sides that at least in part taper toward said mounting surface;

(b) means for connecting each liner segment to the shell of the ore grinding machine;

(c) the liner segments being mounted with tapered sides in side-by-side, opposed relation, defining a pocket between said opposed, tapered sides;

(d) and insert means disposed in each of said pockets for reducing the amount of particulate matter entering said pocket and protecting the inner surface of the shell, each insert means being so configured that it is loosely retained within the associated pocket without direct connection to the shell.

4,165,042

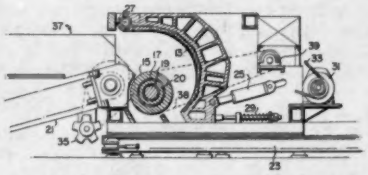
ROTARY JAW CRUSHER

Carl R. Peterson, Boxford, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 12, 1978, Ser. No. 895,694

Int. Cl.² B02C *13/02*

U.S. Cl. 241—198 A **6 Claims**



1. A generally horizontally fed rotary jaw crusher assembly comprising:

horizontal feed means for feeding the material to be crushed in a generally horizontal direction to the cursher;

a large outer stationary jaw having a concave curved material engaging surface;

a smaller inner rotatable jaw having an outer continuous material engaging curved surface and a hollow center portion adapted to receive a center driven shaft about which it can rotate, said inner and outer jaw being located with respect to each other such that at least along a portion of their two material engaging surfaces there is formed a passageway of progressively narrow width into

which all of the material to be cursched is fed from the horizontal feed means in a generally horizontal direction;

the center driven shaft adapted for use with the inner jaw being rotatable about its own center axis and smaller in diameter than said inner jaw's hollow center portion and mounted therein;

eccentric means connected to and moveable with said driven shaft for causing the eccentric motion of said inner jaw's material engaging surface about the center of said driven shaft; and

means located between the eccentric means and inner jaw material engaging surface for allowing the inner jaw's material engaging surface to freely rotate about the center shaft whereby material fed between the inner jaw and the outer jaw is subjected to a peristaltic pumping crushing action.

4,165,043

CRUSHER APPARATUS

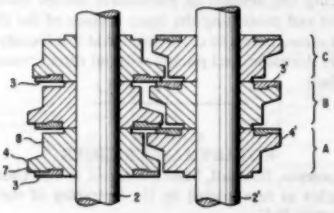
Kazo Higashi, and Kiyohiko Sawa, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Dec. 19, 1977, Ser. No. 862,164

Claims priority, application Japan, Dec. 17, 1976, 51-152613

Int. Cl.[2] B02C *18/18, 18/40*

U.S. Cl. 241—236 **2 Claims**



1. A crusher which comprises a plurality of paired cutter units mounted respectively on a pair of parallel shafts arranged to rotate in opposite directions to one another, wherein:

each of said paired cutter units comprises a holder member consisting of a flange portion and a boss portion, and a disc-shaped cutter blade detachably secured to said holder member and divided circumferentially into several segments;

each of said paired cutter units includes a first and second cutter unit mounted on the respective shafts such that respective cutter blades of said first and second cutter unit contact each other partly at their sides, and that the respective cutter blade and flange portion of said first and second cutter unit are opposed to the boss portion of cutter units mounted on said respective shafts adjacent said first and second cutter unit so as to form a space between their respective peripheries; and

wherein each of said flange portions is provided with pawls along its outer periphery while each of said boss portions is also provided along its outer periphery with alternate ridges and recesses so as to maintain a substantially constant space between the periphery of the boss portion of each of said first and second cutter units and the corresponding periphery of the flange portion of each of said cutter units mounted on said respective shafts adjacent said first and second cutter unit.

4,165,044

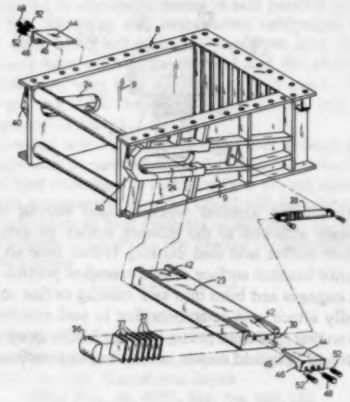
JAW CRUSHER HAVING WEDGES FOR TOGGLE BEAM

Joseph Batch, Milwaukee, Wis., assignor to Barber-Greene Company, Aurora, Ill.

Filed Apr. 10, 1978, Ser. No. 894,717

Int. Cl.[2] B02C *1/04*

U.S. Cl. 241—264 **16 Claims**



1. A jaw crusher comprising, a housing having two opposed, generally vertical side walls, means forming way slots in said walls, a movable jaw suspended within said housing, a toggle beam extending within and transversely across said housing and having a beam end projecting into each of the way slots, said beam ends having an upper surface, a toggle plate within said housing cooperating with said movable jaw and with said beam, a wedge shiftably mounted on said beam ends and in said way slots and located between said upper surfaces of said beam ends and each of said side walls, said wedges acting to wedge said beam ends downwardly in said way slots and against said side walls, and wedge shifting means connected between said wedges and said beam for forceably removing said wedge laterally outwardly from said way slots and also for forceably moving said wedge into said way slots.

4,165,045

DISINTEGRATING MACHINE FOR FOOD

Jürgen Hager, 5609 Hückeswagen-Oberdorp, and Walter Vieth, Arnzhäusen 7, 5679 Dabringhausen, both of Fed. Rep. of Germany

Filed Aug. 3, 1977, Ser. No. 814,264

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1976, 7628629; Nov. 5, 1976, 2650690

Int. Cl.[2] B02C *18/22*

U.S. Cl. 241—282 **6 Claims**

1. A machine for cutting blocks of frozen meat, the machine comprising a frame,

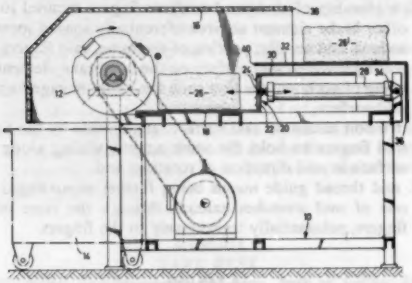
a support mounted on said frame, cutting means mounted on said frame adjacent one end of said support, said cutting means being driven to a cutting motion of predetermined direction,

a pusher member moveable across said support between a first position remote from said cutting means and a second position adjacent said cutting means,

said pusher member having a front wall facing said cutting means and being spaced, in said first pusher member position, from said cutting means a predetermined distance for accommodating a block of meat to be cut,

said pusher member having further plate means extending

from an upper edge of said front wall in a direction pointing away from said cutting means,



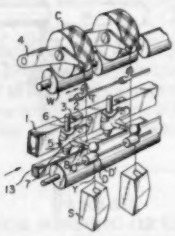
a stationary desk being mounted on said frame and covering said pusher member front wall and plate means in said first position thereof.

4,165,046

DOFFING APPARATUS IN SPINNING MACHINE

Yoshihisa Suzuki, Chiryu; Shozo Ueda; Toshinori Taniguchi, both of Kariya, and Keiji Onoue, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 30, 1977, Ser. No. 856,157
Int. Cl.[2] B65H *54/22, 67/00*
U.S. Cl. 242—35.5 A **18 Claims**



1. In a spinning machine of the type including a spinning unit for spinning yarn, winding means for winding said yarn into a package, cutting means for cutting said yarn when a package is wound, and suction means positioned adjacent the position of cutting of said yarn for grasping the free end of the spun yarn upon the cutting of said yarn, the improvement comprising:

an operating member positioned adjacent said suction means, said operating member being mounted for movement between an inoperative position and an operative position;

said cutting means comprising a fixed cutter blade fixedly positioned at said cutting position and a movable cutter blade connected to said operating member in a manner such that movement of said operating member to said operative position thereof moves said movable cutter blade into cooperation with said fixed cutter blade to cut said yarn; and

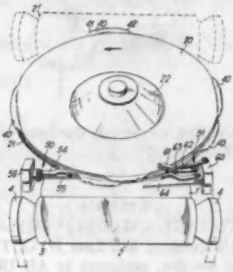
means for closing said suction means when said operating member is in said inoperative position thereof and operable by movement of said operating member toward said operative position thereof for opening said suction means such that said free end of the spun yarn can be grasped by said suction means upon the cutting of said yarn by said cutting means.

4,165,047

YARN WINDER

Gordon Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Feb. 27, 1978, Ser. No. 881,426
Claims priority, application United Kingdom, Mar. 4, 1977, 9254/77
Int. Cl.[2] B65H *54/28*
U.S. Cl. 242—43 A **15 Claims**



1. A yarn winder including a package support roller and traversing mechanism comprising slot-like guides on closely spaced driving members connected to a drive so as to move in opposite directions across a field of traverse, and a deflector arrangement at each end of the field of traverse for assisting the transfer of the yarn from a guide on one driving member at one end of the field and then back to a guide on the first driving member at the other end of the field, each of the deflector arrangements including a control surface which is engaged by the yarn between the two yarn guides and is located in a gap defined on each side by a driving member and its associated yarn guide, the control surface at one end of the field of traverse being arranged to deflect the yarn in a direction away from the guides when the yarn is being transferred from an outer to an inner guide, while at the opposite end of the field the control surface acts to depress the yarn toward the guides when the yarn is being transferred from an inner to an outer guide, the driving members being mounted for rotation in opposite directions and their peripheries being so shaped that each yarn guide is followed in the direction of motion by a cam-like compensating surface for temporarily increasing the yarn path by an amount sufficient to take up the slack which would otherwise be formed immediately after the yarn has been removed from one slot-like guide during transfer of the yarn from one slot-like guide to another.

4,165,048

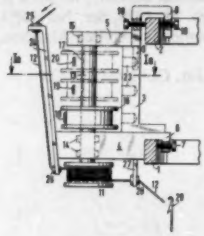
POSITIVE FEED

Horst Paepke, Fasanenweg 30, 7407 Rottenburg, Fed. Rep. of Germany

Filed Aug. 2, 1977, Ser. No. 821,309
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636224; Apr. 7, 1977, 2715578
Int. Cl.[2] B65H *51/20, 51/32;* D04B *15/48*
U.S. Cl. 242—47.01 **17 Claims**

14. In a thread-supply arrangement for use in a textile manufacturing machine, a combination comprising at least one shaft; means for mounting said shaft on the machine for rotation; an accumulator drum mounted on said shaft for joint rotation therewith; means for leading at least one thread toward and away from said accumulator drum; means for rotating said shaft, including a pulley mounted on said shaft for joint rotation therewith and for displacement longitudinally thereof between a plurality of predetermined positions, to effect its

engagement with a selected one of a plurality of advancing elements; and means for disengaging said one advancing element from said pulley to release the latter for displacement longitudinally of said shaft.



4,165,049

THREAD STORAGE AND DELIVERY APPARATUS

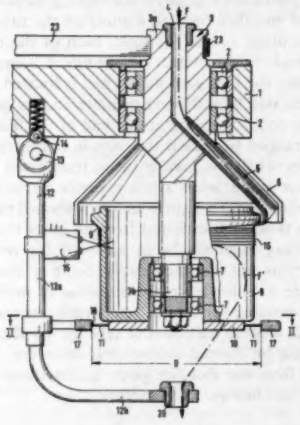
Karel Pejchal, Ulricehamn, and Lars H. G. Tholander, Huskvarna, both of Sweden, assignors to AB IRO, Ulricehamn, Sweden

Filed Jan. 16, 1978, Ser. No. 870,017

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701718; Jun. 3, 1977, 2725185

Int. Cl.[2] B65H *51/20*

U.S. Cl. 242—47.01 **10 Claims**



1. Thread storage and delivery apparatus of the type comprising a shaft that is rotatable in a housing and is driven for rotation in one direction, a thread drum concentrically mounted on a portion of said shaft for rotation relative thereto and upon which thread is wound, and thread guide means so arranged in relation to the drum that thread wound around the drum has a drawn-in stretch extending substantially axially towards the drum from one end thereof and a drawn-off stretch extending substantially axially away from the other end of the drum, said thread guide means comprising a thread guiding part of a thread winding instrumentality that is carried by another portion of said shaft and is moved orbitally by shaft rotation to cause a thread guided thereby to be coiled around the thread drum, said apparatus further comprising braking means for restraining the three drum against rotation in said direction relative to the housing, which braking means is characterized by:

A. a relatively movable brake element concentrically secured to one end of the drum;

B. a relatively fixed brake element secured to the housing;

C. one of said brake elements having a circumferential surface that is concentric to said shaft and is spaced from and substantially directly faces an annular portion of the other brake element;

D. a plurality of elongated resilient fingers secured to said other brake element at circumferentially spaced locations around said annular portion of the same, said fingers projecting towards said surface on the one brake element and being of such lengths that each has its tip engaged against said surface;

E. friction means on said surface, engageable by the tips of said fingers to hold the same against sliding along said surface in said direction of rotation; and

F. said thread guide means being further so arranged that one of said stretches extends through the zone of the fingers, substantially transversely to the fingers.

4,165,050

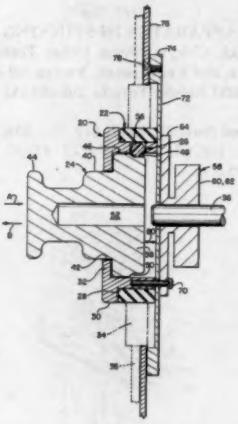
REEL HOLDING HUB ASSEMBLY

Richard G. Berube, Marlboro, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Mar. 20, 1978, Ser. No. 888,182

Int. Cl.[2] B65H *19/02*

U.S. Cl. 242—68.3 **12 Claims**



1. A hub assembly for releasably mounting a reel for rotation on a selected axis, said hub assembly comprising:

a hub member having a hollow cylindrical section with inner and outer surfaces, a flange section extending radially inward of said cylindrical section, and a plurality of circumferentially-spaced openings in said cylindrical section;

means attached to said hub member for supporting said hub member for rotation on said selected axis;

a clamping element in the form of a resilient ring mounted on said hub member in surrounding and directly engaging relation with said outer surface;

a plurality of cam followers for applying an expansion force to said resilient ring so that said ring can exert pressure on a reel mounted on said hub, each of said cam followers being movably disposed in one of said circumferentially spaced openings and being sized so that a portion thereof always protrudes from at least one of said inner and outer surfaces; and

selectively operable actuator means for causing said cam-followers to apply an expansion force to said resilient ring, said actuator means comprising a cam member having a cam section and a neck section, said cam section comprising a first relatively small diameter cylindrical cam surface, a second relatively large diameter cylindrical cam surface spaced from said first cam surface along said axis, and a third frusto-conical cam surface connecting said first and second cylindrical cam surfaces, at least a portion of

said neck section having a smaller diameter than said cam surfaces, said cam member being disposed so that said cam section is surrounded by said hollow cylindrical section and said portion of said neck section is surrounded by said flange section,

said cam member being slidable along said axis relative to said hub member between (1) a release position in which said cam followers are aligned with said first cam surface and said resilient ring is unexpanded relative to said outer surface, and (2) a lock position in which said cam followers are engaged by said second cam surface and displaced outwardly of said axis so as to apply an expansion force to said resilient ring.

4,165,051

TAPE REEL

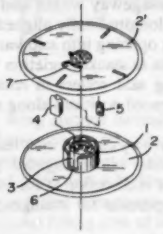
Haruo Shiba, and Masatoshi Okamura, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1978, Ser. No. 924,359

Claims priority, application Japan, Jul. 14, 1977, 52-93532[U]

Int. Cl.² B63H *75/78*

U.S. Cl. 242—74.1 **6 Claims**



1. A video cassette tape reel which comprises at least one flange; a ring hub having a groove in parallel to an axis of the hub; a clamp fitted to the groove; and peripheral guides formed in said hub between which said clamp is fitted, whereby a tape clamped on the ring hub is not contacted with the flange in winding the tape.

4,165,052

APPARATUS FOR WINDING OR UNWINDING OF A CORD-SHAPED WINDING MATERIAL

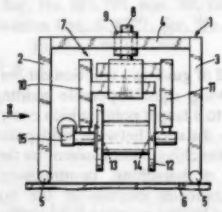
Gerhard Seibert, Vienna, Austria, assignor to Rosendahl Industrie-Handels AG, Schonenwerd, Switzerland

Filed Apr. 3, 1978, Ser. No. 892,962

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1977, 2752817

Int. Cl.² B21C *47/02, 47/24*

U.S. Cl. 242—78.1 **16 Claims**



1. A device for winding and unwinding a cord-shaped material, such as a cable, on and off a spool, respectively, with a spool support unit having two adjustable sleeves for holding the spool and a drive mechanism for rotating the spool, and with a carrier on which the spool support unit is suspended, comprising

a carrier,

at least one spool support unit mounted on said carrier and defining an operating position,

means for rotating said spool support unit by at least 90° about a vertical axis out of said operating position.

4,165,053

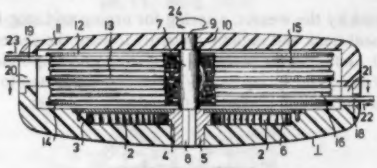
CABLE DRUM FOR AUTOMATIC REWINDING OF A CABLE

Heinz Konig, Obentrautstrasse 33, D-1000 Berlin 61, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,311

Int. Cl.² B65H *75/48*

U.S. Cl. 242—107.1 **9 Claims**



1. A cable drum for automatically rewinding of a cable comprising: restoring spring; a housing holding said restoring spring; a shaft; three disc-shaped walls fastened to said shaft, said shaft extending perpendicular to said walls, said walls defining two winding area means, one of said disc-shaped separating walls being common to both winding areas and having a holding slot for fixing the cable in place; a bushing rotatably carried within a bottom portion of said housing and having a central opening of non-circular cross-section receiving an axially extending protrusion of said shaft having complementary cross-section, an upper portion of the housing being circumferentially connected to said bottom portion, said shaft having an upper trunnion rotatably held in a bore in said upper portion and which completes said bottom portion to form a cylindrically hollow body having a smooth surface; feed-out guide means located within marginal zones of said bottom portion and said upper portion of the housing, one end of said restoring spring being attached to said bottom portion and the other end of said spring being connected to said bushing; said disc-shaped walls comprising cable drum discs connected rigidly to said shaft, said cable drum being prepared for operation by separating the housing portions and removing said cable drum discs, a middle part of the cable to be wound being thereafter pressed into said slot so that a part of the cable is always received by one of said winding area means, one cable end projecting through one exit opening and the other cable end projecting through another exit opening when said cable is substantially wound on the drum so that said cable drum discs are inserted into said bottom portion of the housing, said cable drum being operative after said protrusion of said shaft is inserted into said opening of said bushing and said housing portions are connected.

4,165,054

COMFORT LOCK MECHANISM

Cecil A. Collins, Pontiac, Mich., assignor to Fisher Corporation, Troy, Mich.

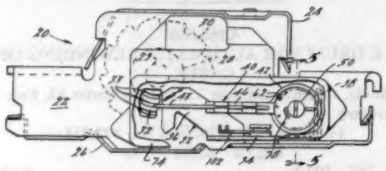
Filed May 3, 1978, Ser. No. 902,732

Int. Cl.² A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107.7 **14 Claims**

1. A safety belt retractor comprising a frame and a spool mounted on said frame, bias means for biasing said spool in a belt retraction direction, said spool having an end flange combined with control means for locking said spool against retraction to relieve tension in said belt, said control means including a disc attached to said end flange for rotation therewith and

having at least one track thereon, a stop-follower for mating with said track, said track adapted to receive said stop-follower positioned into said track and having means engagable by said stop-follower to prevent further retraction of said belt until



released by the wearer, a spring for urging said stop-follower into said track and radially inwardly toward the center of said spool, and a pin for pivotably mounting said stop-follower on said frame, said spring having a first end connected to said pin and a second end connected to said stop follower.

4,165,055

BOBBIN WITH SNAP RING

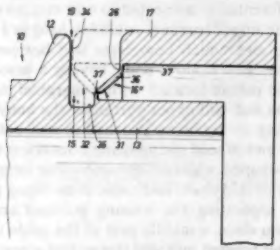
Rudolf Dee, Wuppertal, Fed. Rep. of Germany, assignor to Firma Hacoba Textilmaschinen GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,747

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1976, 2656326; Jan. 24, 1977, 2702802

Int. Cl.[2] B65H *75/28*

U.S. Cl. 242—125.2 **8 Claims**



1. A bobbin for a strand, comprising:

an axially elongated axially symmetrical rigid tubular body adapted to define a thread-receiving slot at a location inwardly from an end of said body;

a generally frustonconical snap ring connected to said body between said location and said end by a first flexible hinge formed unitarily with said body and with said snap ring but having a lesser thickness than said snap ring;

a rigid generally cylindrical sleeve coaxial with said body and spacedly surrounding same while being dimensioned to be received between said locoation and said end; and

a second flexible hinge formed unitarily with said snap ring and said sleeve but having a lesser thickness than said snap ring, said hinges and said snap ring being dimensioned to be displacable between a first position wherein an axial end of said sleeve clamps a strand in said slot at said location and a second position wherein said end of said sleeve is spaced from said location to permit insertion and withdrawal of said strand into and out of said slot, the snap ring being displaced between said positions through a deadcenter position by snap action.

4,165,056

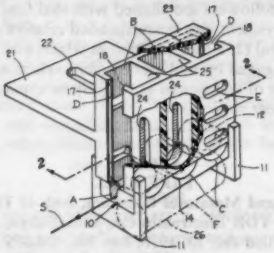
STRAND TENSIONING DEVICE AND METHOD

Hans S. Singer, 191 Inglewood, Greenville, S.C. 29609

Filed Apr. 6, 1978, Ser. No. 894,167

Int. Cl.[2] B65H *59/24, 59/30*

U.S. Cl. 242—151 **15 Claims**



1. A yarn tension device utilizing rollers comprising:

a housing;

an elongated yarn passageway within said housing;

a plurality of spaced longitudinally aligned upright receptacles in said housing opening into said yarn passageway for carrying said rollers in stacked relation therein;

means for positioning said rollers in rotating engagement with said yarn at spaced positions along said yarn passageway; and

a vertical yarn passageway carried in at least one end of said housing opening into said elongated yarn passageway permitting a change in direction of the yarn to cause roller movement to compensate for changes in tension in the yarn.

4,165,057

METHOD OF IMPROVING THE GUIDING OF REACTION DRIVEN FLYING BODIES FOR GROUND-TO-GROUND EMPLOYMENT

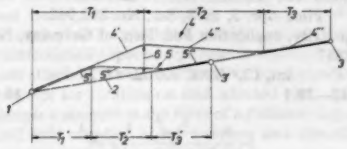
Helmut Hausenblas, Kassel, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 18, 1976, Ser. No. 733,072

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546592

Int. Cl.[2] F41G *7/14;* F42B *15/02;* F41B *9/00*

U.S. Cl. 244—3.12 **5 Claims**



1. The method of guiding a reaction driven flying body such as a rocket having signal operable guiding means from a launching point to a target point, which comprises the steps of: determining the distance between said points, launching the body from the launching point toward the target point, detecting the instant of launching, continuously monitoring the changing instantaneous location of the body by detecting radiation emitted by the reaction driver thereof and developing predetermined flight path program guiding signals correlative to the detected instant of launching, and supplying the guiding signals to said guiding means to cause the flying body automatically to follow a flight path which diverges from a line joining said launching point and said target point during a first flying period following a launching of the flying body and which flight path approaches said line to a point of intersection during a second flying period of said body and then follows

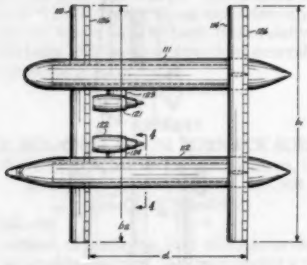
said line to the target point during a third flying period of said body.

4,165,058

TANDEM WING AIRPLANE

Philip C. Whitener, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 648,706, Jan. 13, 1976. This application Nov. 26, 1976, Ser. No. 745,150
Int. Cl.[2] B64C *3/08*
U.S. Cl. 244—45 R **3 Claims**



1. In a tandem wing aircraft having fuselage structure and lifting surfaces, the improvement comprising in combination:

two independent spaced apart fuselages;

a lower forward wing and a higher aft wing, each of said wings having a lifting area ranging from 40% to 60% of the combined total lifting area of all of said lifting surfaces of said aircraft for producing a lift force and for providing aircraft pitch control without production of a downwardly acting load; said lower forward wing being attached to the forward region of each of said spaced apart fuselages; said higher aft wing being aerodynamically spaced apart from and located above the aft region of each of said spaced apart fuselages; and

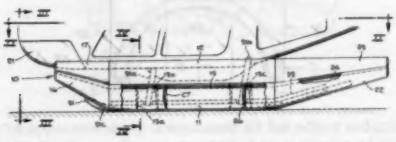
an aft strut member disposed between said aft wing and each of said spaced apart fuselages for attaching said aft wing to said spaced apart fuselages, said aft strut members having a length sufficient to cause the wing tips of said lower forward wing and said higher aft wing to be vertically spaced apart a distance of at least 25% of the span of either of said wings.

4,165,059

FLOAT ASSEMBLY FOR A HELICOPTER OR THE LIKE

James R. Summer, Miami, Fla., assignor to American Safety Equipment Corporation, Encino, Calif.

Continuation of Ser. No. 681,799, Apr. 30, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,699
Int. Cl.[2] B60V *3/08*
U.S. Cl. 244—100 A **15 Claims**



1. A float assembly for supporting a vehicle having a fuselage comprising:

at least two float tubes contiguously secured together so that the centerline of the two float tubes are parallel and lie in a horizontal plane;

a pair of girths, each secured to its own one of said two float tubes;

skid means connected to the fuselage; and

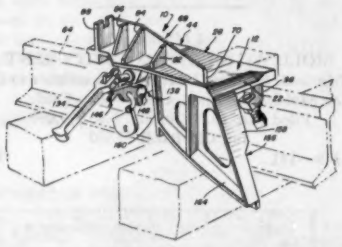
means for securing said skid means to each of said girths, said means being positioned near the contiguous surfaces of said two float tubes so that the forces tending to separate the float tubes from each girth are substantially in the shear direction.

4,165,060

PORTABLE DERAIL

J. Joe Meyer, Williamsburg, Ind., assignor to Western-Cullen-Hayes, Inc., Chicago, Ill.

Filed Mar. 9, 1978, Ser. No. 884,843
Int. Cl.[2] B61L *19/02*
U.S. Cl. 246—163 **14 Claims**



1. A portable derail of a type which may be releasably secured to a rail for derailing a railcar, said derail including a shoe member which overlies the rail, and a derail bar which forces a rail wheel off to one side of the rail, the improvement comprising, in combination, set screw means carried on one side of the derail for engagement under the rail head on the field side thereof, movable clamp means carried on the other side of the derail for engagement adjacent the gage side of the rail head, said clamp means including a clamp plate having a head member, a rotatable screw for moving said clamp plate to a clamped position, said screw being generally horizontally disposed above the height of said rail head, said clamp plate head member being mounted on said rotatable screw, a manually operable handle for rotating said screw, and releasable locking means which in its locked position prevents rotation of said screw.

4,165,061

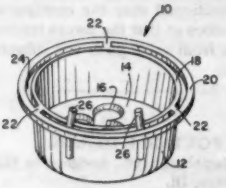
INTEGRALLY FORMED MOLDING UNIT FOR FREEZING A LIQUID WITH A PORTION OF THE UNIT SEVERABLE FOR FORMING A HANDLE FOR THE FROZEN PRODUCT

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Continuation-in-part of Ser. No. 626,654, Oct. 29, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,325
Int. Cl.[2] A23G *9/00*; B22D *5/00*
U.S. Cl. 249—92 **1 Claim**

1. A molding unit for forming a frozen product, said unit comprising a flexible cylindrical container having a bottom and upstanding side wall with the edge thereof defining an opening, spaced apart rods on said side wall extending beyond the edge thereof away from said bottom, the portion of said rods extending beyond the side wall being angularly inclined toward each other with the arcuate extent between said rods being less than 120°, and a flexible and resilient ring circular in plan view detachably connected to said side wall at the edge thereof positioned externally of said rods and connected to said side wall at no more than three distinct points, whereby said flexible and resilient ring upon detachment from said side wall and placement between said spaced apart rods is retained

thereby during freezing of liquid into the frozen product, deformation of said flexible container ejecting the frozen product therefrom with said flexible and resilient ring retained therein forming a handle for said frozen product.

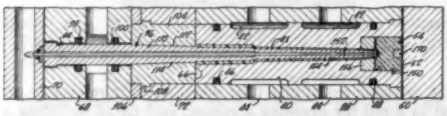


4,165,062

MOLD WITH POROUS CAVITY VENT

John G. Mitchell, Fountain Valley, Calif., assignor to California Injection Molding Co., Inc., Costa Mesa, Calif.

Filed Jan. 13, 1978, Ser. No. 869,059
Int. Cl.[2] B28B *17/00*
U.S. Cl. 249—141 **14 Claims**



1. A mold for injection molding a long thin wall article comprising first and second mold parts mounted for relative motion between mold open and mold closed positions, said first mold part having a long slender cavity formed therein, said second part having a long slender core with an end extending into said cavity closely adjacent an end of said cavity, and a porous vent body mounted adjacent an end of said first mold part, said body having a portion with a recess that defines said end of said mold cavity and extends about said end of said cavity and at least partially about said core end.

4,165,063

LINEAR RETRACTABLE SEAL VALVE

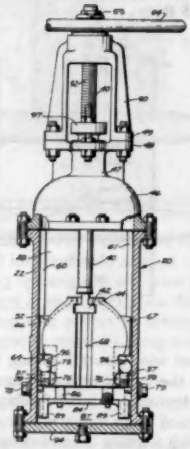
Javed Qasim, Diamond Bar, and Robert W. McJones, Rancho Palos Verdes, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 5, 1978, Ser. No. 893,709
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—168 **8 Claims**

1. In a linear retractable seal valve having a body with an inlet port and an outlet port and a fluid passageway therebetween, said body having a lateral passageway perpendicular to the fluid passageway and a wedge-slip assembly having two closure slips with the respective inside faces slideably engaging separate tapering faces of the wedge located therebetween, said wedge-slip assembly moveable longitudinally from a valve open first location within the lateral passageway to a distant second location where the assembly is positioned in the fluid passageway between the two ports of the valve and where the two slips are restrained from further longitudinal movement and moveable in a perpendicular direction of the longitudinal assembly movement into closure engagement with the two ports of the valve, two diametrically-opposed guide rails extending longitudinally of the inside face of the lateral passageway and into the fluid passageway, said assembly being moveably held by grooves at opposite side edges of the wedge to the guide rails of the valve body, said guide rails lying in a plane paralleling the two valve ports, with the valve being returned to its open position through a reverse sequential movement, the improvement:

wherein at least one of said rails terminates at the second location on the inside wall of the fluid passageway and with the end surface of the terminated rail providing a ramp;

each of the slips having on its inside face a lug which extends in a perpendicular direction of the longitudinal movement of the assembly with the lug of one of the slips overlying that of the other;



said wedge on at least one side edge thereof having a locking notch extending in a transverse direction to the longitudinal assembly movement; and

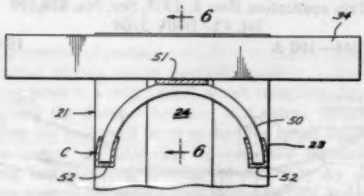
a roller supported on the upper surface of the upper lug, said roller having a first position wherein the roller occupies the locking notch of the wedge and contacts the longitudinal edge of said terminating guide rail, and a second position wherein the roller has moved out of the locking notch of the wedge and out of contact with the longitudinal edge of the terminating rail and into engagement with the ramp at the end of said rail.

4,165,064

GATE VALVE

Madden T. Works, Houston, Tex., assignor to FIP, S.A. de C.V., Mexico

Filed Mar. 13, 1978, Ser. No. 886,259
Int. Cl.[2] F16K *27/04, 27/10*
U.S. Cl. 251—329 **6 Claims**



1. A gate valve, comprising a body including an elongated, generally rectangular section whose front walls are longer than its side walls, and aligned pipe connecting hubs mounted on the front walls, a bonnet assembly on one end of the rectangular section, a gate having a stem cooperable with the bonnet assembly for moving the gate between opened and closed

positions with respect to the hubs, a hoop-like reinforcing flange having a rectangular opening therein disposed about the rectangular body section near the bonnet assembly and arranged perpendicularly thereto, welds securing the inner edges of the flange only to intermediate portions of the front walls of the body section, means connecting the bonnet assembly to the reinforcing flange, including a mounting flange near the end of the bonnet assembly and having an opening through which the stem extends, bolts for drawing together the mounting flange and the reinforcing flange, including portions thereof which are free of securement to said body section, and reinforcing means connecting the unsecured portions of the reinforcing flange to the front walls of the body section in such a manner as to have relatively high rigidity with respect to forces perpendicular to the reinforcing flange and relatively low rigidity with respect to forces which result from relative movement between the body and flange in directions generally parallel to the reinforcing flange.

4,165,065

LIME REMOVAL FROM FURNACE SURFACES

James J. Bowden, 399 Quarry La. NE., Warren, Ohio 44484

Filed Mar. 9, 1978, Ser. No. 884,904

Int. Cl.² C21B *7/00*

U.S. Cl. 266—44 **4 Claims**

1. The method of removing lime buildup on the vessel bottom of a steel-making furnace, said lime having a melting point of about 2570 degrees Centigrade and which is higher than the temperature limits tolerated by the lining of said vessel, said method comprising:

charging into the furnace vessel and onto the built up lime, after the molten metal and slag have been drained from said vessel through its tap hole, a mineral which chemically combines with lime to form a combined mineral having a melting point lower than the melting point of lime and within the temperature limits tolerated by the furnace lining,

heating said combined mineral to a liquid state, and

draining the liquified mineral from said vessel through the latter's tap hole.

4,165,066

APPARATUS FOR ACTIVE REDUCTION OF VERTICAL VIBRATIONS OF A VIBRATING MASS

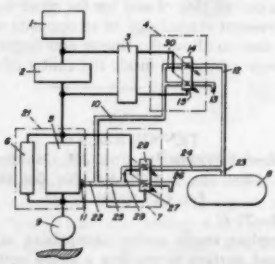
Borut Horvat, Kmetijska 3a, 62000 Maribor, Yugoslavia

Filed Jul. 8, 1977, Ser. No. 813,979

Claims priority, application Yugoslavia, Jul. 12, 1976, 1704/76

Int. Cl.² F16F *9/02*

U.S. Cl. 267—65 D **6 Claims**



1. An apparatus using compressed air for active reduction of vertical vibrations of a mass exposed to a source of random vertical excitations comprising:

a base springing joint positioned between said mass and the source of excitations and including a compressed air springing unit, conduit means having a single pipe connected to said compressed air springing unit for connecting said compressed air springing unit to a source of compressed air and the atmosphere, and a passive damper connected in parallel with said compressed air springing unit;

actuating means responsive to vertical excitations for actuating said compressed air springing unit to reduce the vertical vibrations of the mass and including sensing means positioned in vertical alignment with said base springing joint for sensing vertical excitations, amplification means mechanically connected with said sensing means for amplifying sensed excitations, and first valve means positioned between the source of compressed air and said conduit means of said base springing joint and responsive to said amplification means for selectively connecting the single pipe of said conduit means to the source of compressed air and to the atmosphere so that said compressed air springing unit actively damps sensed vertical excitations; and

second valve means positioned between the source of compressed air and said conduit means and responsive to a static load on said compressed air springing unit for selectively connecting the single pipe of said conduit means to the source of compressed air and the atmosphere so that said compressed air springing unit automatically adjusts for different static loads.

4,165,067

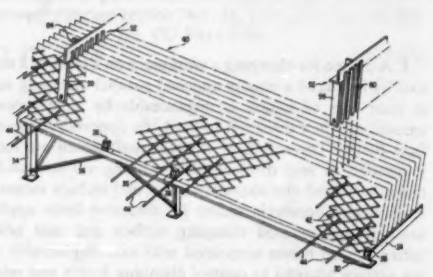
APPARATUS FOR MAKING SUBSTANTIALLY IMPENETRABLE MEMBERS

Emory J. Jernigan, P.O. Box 254, Chester, Va. 23831

Division of Ser. No. 709,271, Jul. 28, 1976, Pat. No. 4,079,497. This application Dec. 7, 1977, Ser. No. 858,342

Int. Cl.² B25B *1/20*

U.S. Cl. 269—40 **11 Claims**



1. A fixture for use in making a core to facilitate the manufacture of substantially impenetrable members which comprises:

(a) a frame having longitudinal and lateral support members,

(b) a plurality of lateral spacing members supported by the lateral support members of said frame,

(1) said lateral spacing members adapted to receive a plurality of expanded metal sheet members to establish a spaced stack thereof with rod members inserted through the openings in said expanded metal sheet members at least some of which extend beyond the sides of said spaced stack thereof,

(c) and means elevating one end of said longitudinal support members with respect to the other end thereof whereby said support rods may be secured to said expanded metal sheet members simultaneously in a number of different positions.

8. In an aligning device for use in connection with the manufacture of a core for a substantially impenetrable member, the construction which comprises:

(a) a main carrier member having bottom and sidewall mounting surfaces,

(b) a first plurality of plate members suspended from a bottom mounting surface of said main carrier member at least

some of which are intended to be inserted between a plurality of expanded sheet metal members to effect lateral spacing thereof,

(c) a second plurality of comb-like teeth members supported from a sidewall mounting surface of said main carrier member,

(d) and means to lock said aligning device to said expanded sheet metal members.

4,165,068

DEVICE FOR CLAMPING A WORKPIECE

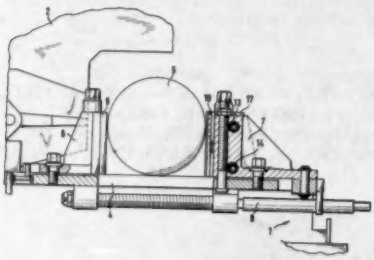
Paul Stolzer, Achern, Fed. Rep. of Germany, assignor to Keuro GmbH & Co., KG., Achern, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,292

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 7702902[U]

Int. Cl.[2] B23Q *3/02*

U.S. Cl. 269—136 **6 Claims**



1. A device for clamping a workpiece on a table of a machine tool by means of mutually opposed parallel clamping surfaces at least one of which is displaceable by a predetermined amount and in a direction toward the opposed clamping surface, further characterized wherein shaft means are rotatably journalled in said displaceable clamping surface, said shaft means arranged one above the other and include means cooperative with eccentric means for directive force application toward said opposed clamping surface and said table and spring loaded means associated with said displaceable clamping surface adapted to control clamping forces and release of said workpiece.

4,165,069

COPIER HAVING REMOVABLE PAPER FEED MODULE

Donald F. Colglazier; Ernest P. Kollar, both of Longmont, and Fred R. Mares, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,988

Int. Cl.[2] B65H *1/00*

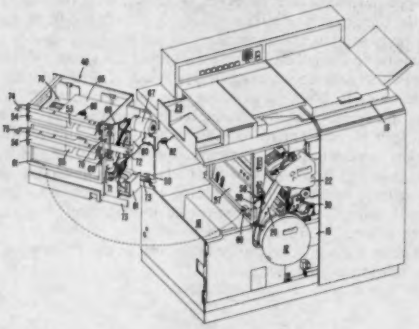
U.S. Cl. 271—162 **9 Claims**

1. In a copier having cut-sheet-supply/sheet-feeding means operable to separate a border sheet from a stack and to feed the separated sheet for use in a copy process to make copies therefrom, the improvement comprising:

a frame member supporting the copier's copy process components, including said cut-sheet-supply/sheet-feeding means, in an operative copy process relationship; and

movable mounting means connecting said cut-sheet-supply/-sheet-feeding means to said frame such that said feeding means is movable between copier-operative and copier-inoperative positions;

said copier-operative position facilitating sheet feeding into said copier for use in said copy process to produce copies on said sheets; and



said copier-inoperative position facilitating copier maintenance by sheet feeding while said feeding means is removed from the remaining copier components.

4,165,070

TORSION AND GRIPPING TYPE EXERCISE DEVICE FOR TOTAL ARM DEVELOPMENT

Max Rice, 120 MacDougal St., New York, N.Y. 10012

Filed Dec. 14, 1977, Ser. No. 860,293

Int. Cl.[2] A63B *21/30*

U.S. Cl. 272—68 **1 Claim**

1. A flange exercise device for strengthening the grip and arm muscles, comprising in combination, an elongated, straight, cylindrical hollow bar, a circular handhold at each end of the bar, a pair of parallel, short legs along a side of said bar, and a circular foot at the end of each said legs, said handholds and said feet each being of a size for being conveniently grapsed within a hand; a peripheral edge of said handholds having an annular groove for receiving fingers and a thumb; said bar, handholds, legs and feet being of plastic and being made rigid respective to each other; and means including a circular hole on one side of said bar for receiving a thumb of a user and a crescent shaped slot on an opposite side thereof for fingers of a user to allow the thumb and fingers to squeeze a resilient sponge positioned inside the center of said bar.

4,165,071

TENNIS RACKET

Jack L. Frolow, 2 Willow Dr., Apt. 3B, Oakhurst, N.J. 07712

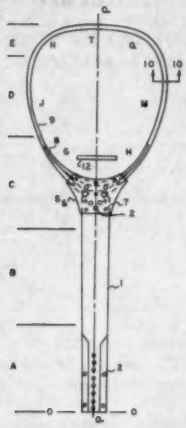
Filed Jan. 5, 1976, Ser. No. 646,848

Int. Cl.[2] A63B *49/02*

U.S. Cl. 273—73 C **82 Claims**

1. A complete tennis racket comprising at least a frame having a head portion supporting a string netting in a plane, and a handle portion having a grip portion suitably adapted for the hand to grip; said netting having a length along the longitudinal axis of said frame greater than 9 inches and a width along an axis perpendicular to said longitudinal axis greater than 7.5 inches; said racket having a weight W in ounces; a center of percussion located at a distance Cp in inches from the end of the grip portion, when tested in accordance with test 4 of FIG. 40 herein before defined, said center of percussion taken about a pivot located at the end of the grip portion, said pivot having

an axis perpendicular to the longitudinal axis of said frame and parallel to the plane of said string netting; said racket having a length L in inches from the end of the grip portion to the end of the head portion; said racket having a center of gravity located a distance C_g in inches from the end of the grip portion; said racket having a first moment of inertia I_s in ounce inches



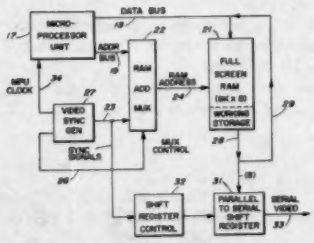
squared about said pivot and I_s is directly proportional to the product of C_p, C_g, W given by the formula $I_s=(C_p)(C_g)(W)$; said racket characterized in that the magnitude of Cp divided by the magnitude of L given by the formula C_p/L is greater than 0.71; and the magnitude of the weight W is less than 10.7 ounces.

4,165,072

METHOD OF OPERATING A VIDEO GAME

David R. Stubben, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Dec. 20, 1977, Ser. No. 862,338
Int. Cl.² A63F 9/00
U.S. Cl. 273—85 G **5 Claims**



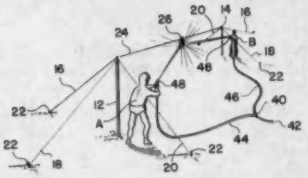
1. A method of operating a video game having a video display screen with a plurality of resolution elements scanned at a predetermined rate by television sync signals and a microprocessor unit (MPU) and also having a full screen random access memory (RAM) having a storage location for every resolution element of said video display screen, said method comprising the following steps: during a first time period under the control of said television sync signal accessing video data from said RAM and storing such data in serial format; during a second time period performing, by use of said MPU, updating of said RAM and other necessary game functions; during both of said time periods reading out said stored data to said display screen at said predetermined scan rate; and thereafter repeating said step of said first time period for additional video data.

4,165,073

WATER GUN GAME WITH REVOLVABLE TARGET MOVABLE ALONG A LINE

Donald L. Kellerstrass, 303 Daniel Pkwy., Washington, Ill. 61571

Filed Mar. 16, 1978, Ser. No. 887,019
Int. Cl.² A63B 63/06; A63H 23/00
U.S. Cl. 273—101 **3 Claims**



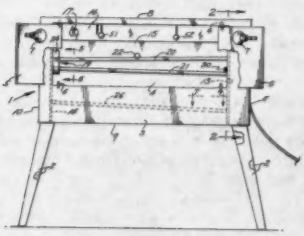
1. Water gun game apparatus, comprising, in combination, a pair of spaced apart vertical uprights; a line extending between said uprights above the ground; a target including a bracket having a pulley wheel suspended from said line in the upper part thereof and a hollow member revolvably mounted in the lower part thereof and a plurality of water guns associated with each player playing the game for directing a jet of water upon said target so as to move same toward the end opposite one of said players.

4,165,074

MECHANICAL TARGET

Norman L. Bonser, 2683 Oxford Ct., Eugene, Oreg. 97404

Continuation-in-part of Ser. No. 672,519, Mar. 31, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,485
Int. Cl.² F41J 9/00
U.S. Cl. 273—105.6 **9 Claims**



1. A mechanical target for target shooting, said target comprising,

an enclosure,

ball members,

ball guide means including inclined rails within said enclosure during the traversing of which a ball member constitutes a target, said rails forwardly spatially offset from a projectile backstop of the enclosure and lengthwise orientated within said enclosure, said guide means additionally including ball transfer means between adjacent rails ends for transfer of gravitating ball members therebetween, said transfer means including a yieldable member guiding said ball members during their downward transition from one rail end to the other rail end,

a ball lift mechanism including a belt having one run facing toward said rails and receiving gravitating ball members discharged from said guide means, said lift mechanism including ball member carriers each of which is secured to one segment of said belt, each of said carriers also in rested contact with another segment of said belt during ball member elevation,

stationary restraining means acting on said ball members to

confine same against horizontal movement while on said lift mechanism, and

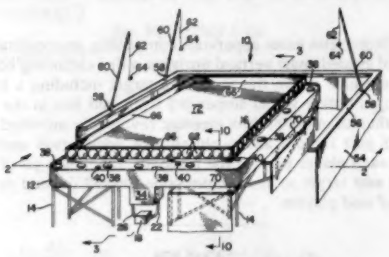
ejector means acting on said ball members to unload same from said lift mechanism onto said rails, said ejector means including a spring biased discharge member movable between said one belt run and the stationary restraining means and gradually biased toward a cocked position adjacent said belt by a confined ball member during ball member upward travel on said lift mechanism.

4,165,075

FISHING GAME DEVICE

Mark Popovich, Ruskin, Fla., assignor to Fair Equipment Company, Inc., Arlington, Va.

Filed Jun. 30, 1977, Ser. No. 811,683
Int. Cl.[2] A63H *23/10*
U.S. Cl. 273—140 **19 Claims**



1. A fishing game device, comprising:

an open-top tank having a fluid therein;

a plurality of floating units on said fluid's surface, each of said units having ferromagnetic material contained therein;

means for causing a flow of said fluid in said tank whereby said units travel about said tank;

means for a player positioned at a distance from said tank to retrieve said units individually from said fluid's surface, said retrieving means including a magnet to engage said ferromagnetic material;

said units varying in size; and

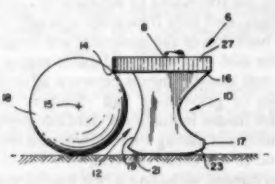
said ferromagnetic material varying in size among said units whereby the chance of retrieving units of different sizes by a player positioned at a distance from said tank varies among said units.

4,165,076

GOLF PUTTER

Richard T. Cella, 160 E. 46th St., New York, N.Y. 10017

Filed Feb. 7, 1977, Ser. No. 766,357
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—168 **2 Claims**



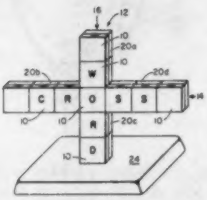
1. An instrument for imparting roll to a spherical object comprising a shaft and an object contacting blade secured to the end thereof, said blade having a front face on which there is provided a top longitudinal projection having an exposed bottom striking edge, the top side edges of the face converging respectively to the ends of said projection, the rear face of said blade having a curved surface there being provided a projection at the bottom thereof with a second striking edge.

4,165,077

WORD GAME

Ronald D. Falcione, 17 Old Pottery Ln., Norwell, Mass. 02061

Filed Apr. 6, 1977, Ser. No. 785,065
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—239 **7 Claims**



1. A word game method associated with

a plurality of tiles, the majority of said tiles having alphabetic characters displayed thereon and the remaining tiles being blank, and

a plurality of tile support means having a plurality of tile receiving spaces for supporting the tiles in an intersecting pattern of at least one column and at least one row, whereby each tile can be supported so that its indicia bearing portion, if any, can be read, and one of said spaces being at an intersection of each row and column, and

the rules of the game method comprising the following steps:

each player chooses words which can be placed in each row and column of the tile support means thereby forming a word-cross combination,

a first player asks a selected opposing player whether his word-cross combination has a specific symbol,

if a particular selected player has that symbol in one or more heretofore unrevealed positions of his word-cross, he discloses one position by placing a tile bearing that symbol in a corresponding space in his tile support means,

if a player guesses correctly he guesses again,

if a player guesses incorrectly, the next successive player takes his turn, and

play continues until the tile support means of one player only is not entirely covered with tiles.

4,165,078

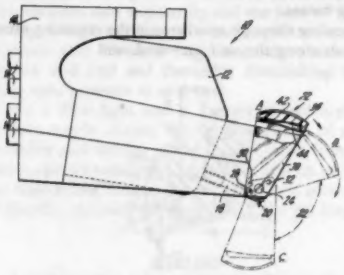
FLIP-UP STYLUS PROTECTOR FOR A PHONOGRAPH CARTRIDGE

John P. Kuehn, Danbury, Conn., assignor to Audio Dynamics Corporation, New Milford, Conn.

Filed Apr. 26, 1978, Ser. No. 900,053
Int. Cl.[2] G11B *21/00*
U.S. Cl. 274—1 R **7 Claims**

1. A phonograph cartridge comprising: a cartridge body; a groove engaging stylus extending from said cartridge body, pivotal mounting means, a protective member pivotally mounted to said cartridge body by said pivotal mounting means; a magnifying lens disposed on said member, at least two detents on one of said member and said body; at least two projections on the other of said member and said body, said detents and said projections being selectively removably engagable to define at least two positions of said member with respect to said body; at said first position of said member said

stylus being at the focus of said magnifying lens to thereby provide a magnified image of the stylus; at said second position



of said member, said member being disposed beneath said stylus to prevent said stylus from engaging said groove.

4,165,079

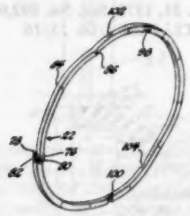
FLUID SEAL RING

John A. Clements, The Hague, Netherlands, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1978, Ser. No. 930,144

Int. Cl.[2] F16J *9/20*

U.S. Cl. 277—9.5 **2 Claims**



1. A seal assembly responsive to heated pressurized fluid: a first member having an outer cylindrical surface; a second member having an internal cylindrical surface; means to support said members for relative rotation with said cylindrical surfaces in concentric relation with a small clearance space between said surfaces; an annular groove in one of said members having an annular base located a predetermined groove depth substantially larger than said clearance space from the surface of said one of said members and parallel annular side walls spaced apart a predetermined groove width; a split annular seal ring made of flexible resilient material having an inner diameter annular surface and an outer diameter annular surface radially spaced apart a cross section height slightly less than said groove depth and side annular faces axially spaced apart a cross section width substantially less than said groove width and being axially undulated to provide undulations on said side annular faces having a total undulated free width sufficiently larger than said groove width so that on placing said seal ring in said groove said seal ring is partially flattened and prestressed with said undulated side faces engaging said side walls to hold said seal ring with one annular surface flush or slightly submerged in said groove and the other annular surface adjacent said base for assembly of one member into the other member without damaging said seal ring; said seal ring being responsive to the flow of heated fluid in said clearance space past said groove and seal ring to enter said groove between the undulations of said seal ring to flatten said seal ring and move said seal ring partially out of said groove and hold said one annular surface in sealing contact with the cylindrical surface on the other of said members.

4,165,080

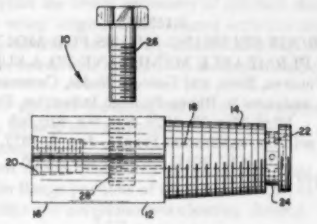
PACKING SEALER PLUG

Harold R. Adams, Rte. 1, St. Francisville, Ill. 62460

Filed May 26, 1978, Ser. No. 910,133

Int. Cl.[2] F16L *55/10;* **F16J** *15/40*

U.S. Cl. 277—72 FM **2 Claims**



1. A packing and sealer plug for entry of packing into a fitting and sealing the same, said plug comprised of a body having an externally threaded portion at one end adapted to engage an internally threaded fitting, said plug having an internally threaded opening at a second end adapted to receive a threaded nozzle of a packing gun or the like for admission of packing thereto, a passageway connecting said internally threaded opening with radial ports at the end of said externally threaded portion, said externally threaded end portion being provided with an external circumferential groove communicating with said radial ports for distribution of said packing uniformly around the end portion of said plug.

4,165,081

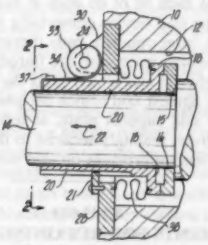
CONSTANT FORCE FACE SEAL

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1978, Ser. No. 896,128

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—88 **6 Claims**



1. In combination: a housing having an opening therein; a rotary shaft extending through said opening so that one section of the shaft is located within the housing and another section of the shaft is located outside the housing; means for sealing the annular clearance between the shaft and the housing; said sealing means including a first annular sealing disc carried by the shaft and having a smooth flat seal face extending radially relative to the shaft axis, a sleeve slidably encircling the shaft for axial movement therealong, and a second annular sealing disc carried by the sleeve, said second disc having a smooth flat seal face extending radially relative to the shaft axis in juxtaposition to the seal face on the first disc whereby fluid is prevented from passing across the annular joint defined by the seal faces; and zero rate spring means trained between the housing and sleeve for urging the sleeve in the direction that will press the second sealing disc against the first sealing disc; said spring

means comprising at least one rotary spool and a strip of spring stock coiled thereon, each spring strip being pre-stressed toward a condition of minimum radius of curvature so that the strip tightly encircles the spool; the spool being rotatably attached to one of said housing and sleeve, and the exposed end of the spring strip being anchored to the other of said housing and sleeve.

4,165,082

LEAKPROOF SECURING MEANS FOR MOUNTING A SEMI-PERMEABLE MEMBRANE TO A SUPPORT

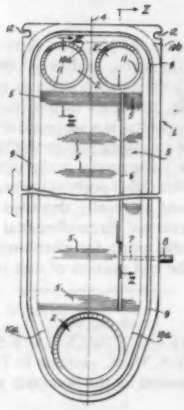
Jacques Foucras, Bron, and Georges Rodet, Communay, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 30, 1978, Ser. No. 910,765

Claims priority, application France, Jun. 2, 1977, 77 17472

Int. Cl.[2] B01D *25/26;* F16J *15/06*

U.S. Cl. 277—166 **19 Claims**



1. A device for the leaktight securing of semi-permeable membranes to opposite faces and around at least one orifice in a support plate, said orifice having a flared surface portion at the periphery of each of of its ends at opposite faces of said support plate, the said device comprising two rings extending into said orifice from opposite ends thereof, the rings having flared surfaces which mate with the flared surface portions of the orifice peripheries and which press the edges of said membranes sealingly against said orifice periphery surface portions on the sides of said support plate, at least one of said rings having a lip thereon sealingly secured to the other ring at said lip to maintain sealing pressure on said membranes.

4,165,083

ARRANGEMENTS FOR RETAINING AND SEALING WINDOW GLASS

Johann Dochnahl, Willich, Fed. Rep. of Germany, assignor to Draftex Development AG, Switzerland

Filed Mar. 8, 1978, Ser. No. 884,473

Claims priority, application United Kingdom, Mar. 11, 1977, 10337/77

Int. Cl.[2] E06B *7/22;* F16J *15/16*

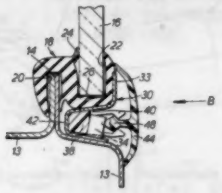
U.S. Cl. 277—184 **11 Claims**

1. A sealing and retaining arrangement for sealing and retaining window glass in a window opening defined by a surround which supports a flange running around the opening, comprising

flexible sealing means mounted on the flange and defining a channel receiving an edge of the window glass and running along the length of at least a portion of the flange,

a stiff retaining member defining a longitudinal channel the distal edge of one of whose side walls is extended to define a longitudinally extending lip, the retaining member being positioned to run along the length of at least a portion of the said sealing means with the latter seating on an external wall of the channel of the retaining member so that the said lip makes contact with an external surface of the sealing means,

pins extending through apertures in the retaining member at intervals along the said surround, and



locking means including wedge-shaped locking members each of which is removably wedged between the inside of the base of the channel of the retaining member and a respective one of the said pins for releasably locking the retaining member to the said surround so that it retains the sealing means on the flange.

4,165,084

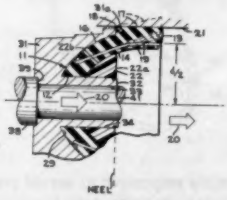
RECIPROCATING PUMP PACKING

Dennis D. Kempf, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 31, 1978, Ser. No. 892,069

Int. Cl.[2] F16J *1/06, 15/16*

U.S. Cl. 277—212 C **6 Claims**



1. In a reciprocating pump, an improved piston assembly including a single packing adapted to be coupled to the pump rod for reciprocal motion within the cylinder of the reciprocating pump, said packing including

a resilient, generally cup-shaped body member of an elastomeric material adapted to be coupled to said pump rod, said body member including an inner annular portion and an outer annular lip,

said annular lip of said resilient body member having a forward edge defining the radially outer annular edge of said body member and a heel spaced rearwardly therefrom with a predetermined relaxed profile therebetween providing a maximum diameter at said forward edge, said forward edge being the leading edge when said pump rod is moved against the pressure of fluid in said pump,

and means for coupling the inner annular portion of said body member to said pump rod, wherein the improvement comprises:

a plurality of circumferentially spaced cantilever spring members embedded in said resilient body member and extending therein from a fixed position within the inner annular portion of the cup-shaped body member through substantially the entire length of the lip to a position radially underlying said forward edge of said annular lip,

said annular lip being disposed for engagement within the bore of the cylinder and said unstressed maximum diameter of said forward edge thereof being substantially

greater than the diameter of said bore so that said annular lip is compressed thereby so that the portions of said spring members within said lip are deflected and a predetermined pressure profile is induced by said spring members between said annular lip and the bore of the cylinder having a high pressure contact region extending from adjacent said forward edge a predetermined distance toward said heel and thereafter diminishing to substantially zero pressure at said heel,

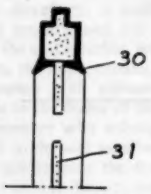
whereby a fluid-tight seal is formed at said high pressure contact region during the suction stroke of said piston assembly and foreign matter is precluded from entry between said forward edge on said annular lip and the cylinder wall during the pressure stroke of said piston assembly to thereby enhance the wear life of the packing.

4,165,085

FOAMED PLASTIC LUBRICATING SEAL

Stig Persson, Katrineholm, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

Filed Sep. 12, 1977, Ser. No. 832,458
Claims priority, application Sweden, Oct. 18, 1976, 7611517
Int. Cl.[2] F16J *15/20, 15/32*
U.S. Cl. 277—228 **11 Claims**



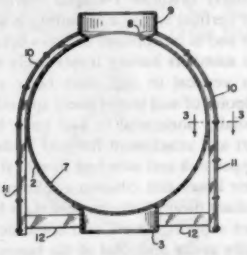
1. A unitary, one piece seal for a gap between at least two surfaces comprising a single, one piece body member made of a foamed plastic material consisting of at least one homogeneous liquid impermeable hard and rigid peripheral surface portion and at least one porous portion of the same material, said porous portion filled with a lubricant, said porous portion being exposed through at least one section in said homogeneous peripheral surface portion to permit transfer of lubricant therethrough.

4,165,086

CLEANABLE DRAIN FOR TANKER VEHICLE

John J. Glassmeyer, Glenwood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 21, 1978, Ser. No. 898,755
Int. Cl.[2] B60P *3/22*
U.S. Cl. 280—5 R **16 Claims**



1. For a highway vehicle having a generally cylindrical tank assembly having a skin and including longitudinally spaced reinforcing members and a filling port arrangement in the upper proximity of the tank skin having a reservoir about the periphery thereof to prevent run-off of fluent product onto the other surface of the tank skin, an improved reservoir drainage arrangement, comprising:

a drain tube having an upper end portion carried on the outer surface of the tank and opening into the reservoir and a lower end portion depending therefrom and extending beyond the lower proximity of the tank skin,

said tube being longitudinally aligned with one of said reinforcing members and having an inner channel portion and an outer removable cover plate means coextensive therewith,

said inner channel including an outwardly opening inner trough section and outer brim flange portions extending therefrom, and

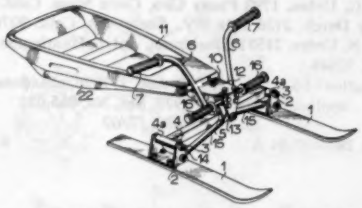
attachment means removably securing said plate means to the brim flange portions of the inner channel to form said drain tube and accommodate cleaning thereof.

4,165,087

SNOW-SURFACE DRIVING VEHICLE

Kunihiko Kagawa, Tokyo, Japan, assignor to Mas Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1978, Ser. No. 883,676
Claims priority, application Japan, May 6, 1977, 52-051889
Int. Cl.[2] B62B *13/04*
U.S. Cl. 280—16 **5 Claims**



1. A snow-surface driving vehicle characterized in the following; there are equipped a pair of skis, left and right, along the longitudinal direction of each of which is mounted a bracket; the left and right ends of a bridging member arranged between and transverse to said two skis are supported by means of said brackets; a handle supporting member is attached to the center of said bridging member and said handle supporting member is linked a little ahead of its center by means of a vertical shaft with a connecting member installed in front of the man seating portion; a handle is rigidly connected to said handle supporting member, between said connecting member and said brackets, control rods are mounted through the intermediary of universal joints being fixed at spots apart from the lines of axes of the brackets, whereby motion imparted to said handle causes a change in the orientation of said skis.

4,165,088

COMBINATION CART

Dale W. Nelson, 375 N. 400 East, Orem, Utah 84057

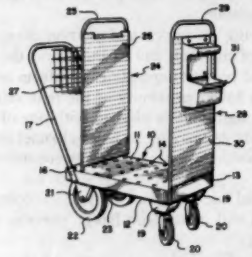
Filed Feb. 21, 1978, Ser. No. 879,070
Int. Cl.[2] B63B *3/02*
U.S. Cl. 280—47.35 **11 Claims**

1. A cart for multiple use comprising;

(a) a deck having an upper and lower surface containing a series of walled apertures open at both ends extending between and continuous with the upper and lower surfaces, said apertures being in spaced relationship on the deck surfaces and being tapered such that the aperture diameter at the upper surface is greater than the diameter of the same aperture at the lower surface;

(b) a set of front swivel wheels mounted to means in the lower front surface of the deck and a set of rear wheels

mounted to means in the lower rear surface of the deck and,



(c) handle means extending upwardly and rearwardly from the rear portion of the deck.

4,165,089

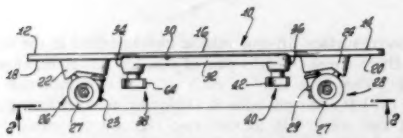
FLEXIBLE SKATEBOARD

Myron G. Urdea, 1790 Panay Ciro, Costa Mesa, Calif. 92626; Doyle Darch, 3130 Rita Wy., Santa Ana, Calif. 92704, and John N. Urdea, 21551 Brookhurst, Apt. 6, Huntington Beach, Calif. 92646

Continuation of Ser. No. 710,968, Aug. 2, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 865,032

Int. Cl.[2] A63C *17/02*

U.S. Cl. 280—87.04 A **6 Claims**



1. A selectively adjustable flexible skateboard comprising:

an elongate board having a bottom surface and a top surface;

a first wheel assembly mounted on said bottom surface adjacent one end of said board;

a second wheel assembly mounted on said bottom surface adjacent the other end of said board;

a strengthening member mounted between said first and second wheel assemblies; and

means connected between said strengthening member and said board for adjusting the flexibility of said board having a specified load, said means comprising:

a threaded shaft extending through an aperture in both said board and said strengthening member; and

an adjusting member mounted on said threaded shaft and located beneath said strengthening member, said adjusting member movable between a first position and a second position, said adjusting member in said first position allowing relative movement between said board and said strengthening member to permit a specified deflection in said board from a weight placed on said board, said board not moving relative said strengthening member when said adjusting member is in said second position resulting in significantly less deflection in said board with said weight than said specified deflection.

4,165,090

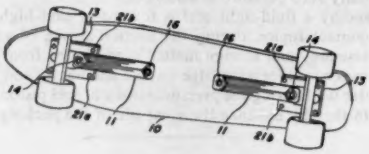
CURB SLIDER DEVICE FOR SKATEBOARDS

Richard C. Feddersohn, 249 Vista Del Monte, Anaheim, Calif. 92807, and William S. Schaffer, 1252 Richard Ave., Orange, Calif. 92669

Filed Jan. 31, 1978, Ser. No. 874,036

Int. Cl.[2] A63C *17/00*

U.S. Cl. 280—87.04 A **3 Claims**



1. For use in a skateboard device with two truck means, two slider means, attachment means at each end of the slider means, one end attachment means of each slider means connected with a portion of a truck means located furthest from the skateboard, at least one predrilled hole means central to the width through the skateboard located to interconnect with the other end of each slider means so as to form an angle of not less than 15° or greater than 45° between the skateboard and the slider means.

4,165,091

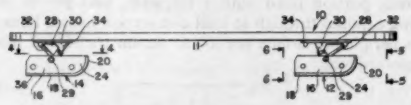
SNOWBOARD

Daniel E. Chadwick, 43 Raymond Ave., Rutherford, N.J. 07070

Filed Jun. 21, 1977, Ser. No. 808,711

Int. Cl.[2] B62B *13/06*

U.S. Cl. 280—12 H **2 Claims**

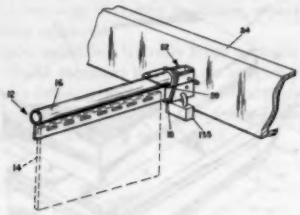


1. In a snow surfboard comprising a single continuous elongated main body having secured thereto, on its underside at the front and rear thereof, a first and second pair of snow skis for contact with a snow-laden surface wherein each ski of each pair is parallel to the other, the improvement which comprises said first and second pair of skis secured to said main body by securing means wherein each securing means is comprised of an inverted angularly oriented T-shaped support means secured at its upper vertical end to a mounting bracket fastened to said main body and at its opposite end to a brace comprised of two H shaped members having transversely spaced members substantially vertical to said main body and interconnected at the midpoint of said transversely spaced members by members substantially horizontal to said main body thereby providing support and attachment for said T-shaped support means at their upper end and attached to said first or second pair of skis at their lower end wherein a solid member is coupled through resiliant means between said main body and said inverted T-shaped support means, said solid means being attached substantially at the midpoint of the horizontal member of said inverted T-shaped member at one end and extending angularly upward and backward and attached to said main body at its other end.

4,165,092
BRACKET FOR REMOVABLY MOUNTING A MUD FLAP ASSEMBLY

Daniel K. Herlein, Muskegon, Mich., assignor to Fleet Engineers, Inc., Muskegon Heights, Mich.

Filed Feb. 8, 1978, Ser. No. 876,033
Int. Cl.[2] B62B *9/16*; B62D *25/16*
U.S. Cl. 280—154.5 R **7 Claims**



1. In a mud flap assembly for mounting a mud flap onto a motor vehicle frame, the mud flap assembly having a seat member, a face plate rotatably seated against the seat member, an arm attached at one end thereof to the face plate, and extending outwardly therefrom, a resilient tensioning means connecting the seat member and arm for retaining the face plate seated against the seat member, and a mud flap extending down along the arm, the improvement comprising:

a first bracket member with substantially parallel flanges fixedly mountable to the frame of the vehicle;

a second bracket member with substantially parallel flanges fixedly mountable to the seat member; and

a hitch means for interlocking the first and second bracket members together so that the arm extends horizontally outward from the vehicle frame, and the mud flap assembly is removable from the frame as an assembled structure;

the hitch means including a slot means in each parallel flange of one of the first and second bracket members and a rigidly connected projection extending between each parallel flange in the other of the first and second bracket members, the projection and slot means sized such that the slot means receives the projection; and

a retainer means for retaining the projection within the slot means;

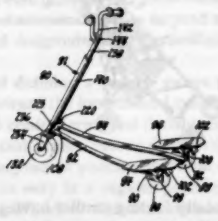
the slot means includes a slot in each flange;

the flanges of each bracket member are spaced apart such that when the projection engages the slots, the flanges of one bracket member abuts the flanges of the other bracket member along facing surfaces of the flanges.

4,165,093
OCCUPANT PROPELLED CAMBERING VEHICLE

Edward J. Biskup, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 779,337, Mar. 21, 1977, Pat. No. 4,123,079.
This application May 24, 1978, Ser. No. 908,971
Int. Cl.[2] B60G *19/00*; B62K *15/00*; B62M *1/04*
U.S. Cl. 280—220 **2 Claims**

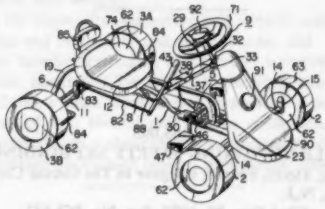


1. A three-point surface contact cambering vehicle having a longitudinally extending roll axis and comprising an upright steering column, an elongated steering shaft mounted in said steering column for turning movement about a substantially vertical axis, a steerable front surface contact means operatively connected to the lower end of said steering shaft for engagement with a support surface, a manual steering device operatively connected to the upper end of said steering shaft, a pair of elongated trailing arms extending rearwardly from said steering column, laterally spaced rear surface contact means operatively connected to the rear portions of said trailing arms for engagement with the support surface, foot support means for an operator of the vehicle mounted on each of said trailing arms adjacent to each of said rear surface contact means, said trailing arms taking the form of leaf springs the forward ends of which are fixed with said steering column for permitting said trailing arms to swing about a transverse axis and thereby allow the operator to roll said vehicle with respect to said roll axis and cause said trailing arms to move in opposite directions so that the rear surface contact means camber by an amount substantially equal to the vehicle roll.

4,165,094
JUVENILE TOY VEHICLE

Isao Onda, Kitamoto, Japan, assignor to Ageo Industries Co., Ltd., Saitama, Japan

Filed Jun. 6, 1977, Ser. No. 803,953
Int. Cl.[2] B62M *1/02*
U.S. Cl. 280—261 **1 Claim**



1. A juvenile toy vehicle comprising:

a pipe frame body;

front wheel axle means supported by said frame body and having a first pair of bilateral wheels mounted adjacent opposed ends, said front wheel axle means including a pair of front wheel axles each formed by a one-piece member having a horizontal and upstanding portion and a steering piece extending rearwardly from proximal end of said upstanding portion;

rear wheel axle means supported by said frame body and having a rear pair of bilateral wheels mounted adjacent opposed ends, said rear wheel axle means including an axle, a wheel cap provided with a plurality of rotational force transmitting pawl means rigidly mounted laterally outside of the positions at which said rear wheel axle means is journaled, one of said first pair of bilateral wheels being provided with a central aperture for receiving the end of said axle and a plurality of apertures for receiving said plurality of rotational force transmitting pawl means, said one rear wheel being fitted on said end of said rear axle means with said apertures aligned and receiving said rotational force transmitting pawl means thereby to form a driving wheel making integral rotations with said rear wheel axle means, the other of said rear bilateral wheels being loosely fitted on the other end of said rear wheel axle means to form an idle wheel;

a sprocket wheel rigidly carried by said rear axle means;

a pedal crank shaft carried by said body frame, said pedal crank shaft being carried by a bearing device including a pair of complementary bushing half members rotatably receiving said shaft therebetween, a supporting plate carried by said body, and a bushing member retaining

device for removably attaching said bushing half members to said supporting plate;

a second sprocket wheel rigidly carried by said pedal crank shaft;

an endless chain linking said first sprocket wheel with said second sprocket wheel;

braking means including a brake rod having crank-like curved, laterally opposed ends carried by said body at the rear thereof, so that the distal end portions of said brake rod are placed frictionally in contact with the periphery of said rear wheels when said brake rod is manually rotated;

a saddle adjustably carried by said frame body; and,

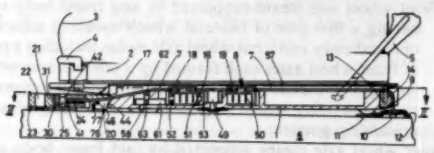
a steering device operatively linked with said front wheel axle means, said steering device including a steering rod having a coplanar U-shaped curvature in the intermediate portion thereof and the vertical, laterally opposed ends thereof loosely received in an aperture in each of said steering pieces, a steering wheel support piece disposed in the intermediate portion of said body at the front thereof, a steering wheel rod having an upper portion rotatably extending through an aperture of said steering wheel support piece and a U-shaped distal end portion in which said U-shaped curvature of said steering rod is loosely engaged.

4,165,095

SELF RESTORING SAFETY SKI BINDING

Alain Neau, Thyez, France, assignor to The Garcia Corporation, Teaneck, N.J.

Filed Dec. 22, 1977, Ser. No. 863,437
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—613 **6 Claims**



1. In a ski binding comprising a sole plate, at least one flexible cable connecting an extremity of said sole plate to a ski and at least one elastic tension device housed within said sole plate and associated with said flexible cable to place a continuous tension thereon for releasable retaining said plate on said ski; an improved cable length adjustment which comprises:

means defining a housing secured to the surface of said ski adjacent an end of said sole plate;

a support element rotatably mounted within said housing, said support including means for securing an end of said cable thereto off center in relation to the axis of rotation thereof, said support further including pawl means elastically urged toward the inner wall of said housing;

a series of teeth arranged on said inner wall of said housing, said teeth being arcuately arranged for engagement by said pawl means; and

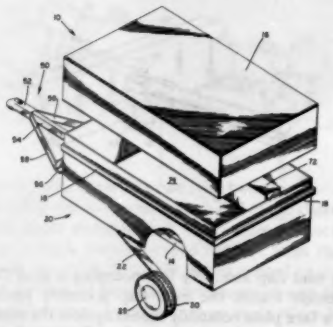
means arranged on at least said pawl means for manually disengaging said pawl means from one of said teeth whereby said support may be manually rotated to alter the effective length of said cable.

4,165,096

STORABLE UTILITY TRAILER

Thomas J. Lewis, Jr., 3085 E. Shadowlawn Ave., Atlanta, Ga. 30305, and Lester S. Hardwick, 400 Fulton Federal Bldg., Atlanta, Ga. 30303

Filed Mar. 20, 1978, Ser. No. 888,235
Int. Cl.[2] B62D *21/18*
U.S. Cl. 280—641 **7 Claims**



1. Foldable utility trailer apparatus comprising:

body means defining an upwardly extending open area for receiving a load;

means located beneath said load receiving area for defining a pair of wheel receiving receptacles;

means mounted beneath said body means for supporting a pair of wheels either in lowered position in which said wheels are upright and engage the ground for traveling support of said body means, or in a raised position in which said wheels remain upright and occupy said wheel receptacles, thereby lowering the overall height of said trailer apparatus;

cover means configured to fit over said upwardly extending open area of said body means, so as to enclose loads received therein; and wherein

the underside of said body means is configured to fit within said cover means when said wheels are in said raised position, so that said trailer apparatus can be stored with the underside thereof enclosed by said cover means when not in use.

4,165,097

STROLLER CANOPY

Robert J. Boudreau, and Joel C. Cunard, both of Bedford, Pa., assignors to Hedstrom Co., Bedford, Pa.

Filed Jan. 2, 1976, Ser. No. 646,331
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—647 **6 Claims**

1. In a bi-directionally folding stroller having spaced apart, foldable pusher handles, a canopy comprising

A. a pair of spaced-apart side frame members having corre-

sponding first ends pivotally connected to the pusher handles;

B. means near the unpivoted ends of the frame members for holding said members apart;

C. a sheet of flexible fabric material extending between said side frame members, and

D. means for removably securing the fabric material to the side frame members at points near the opposite ends of said side frame members to maintain the fabric material under a two-way stretched condition, wherein the securing means comprise

(1) fingers extending laterally from opposite ends of said side frame members toward one another, and

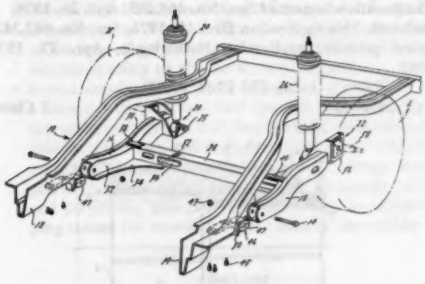
(2) means defining pockets in said fabric material adjacent the opposite ends of said side frame members and for removably receiving said fingers.

4,165,098

REAR SUSPENSION APPARATUS FOR A MOTOR VEHICLE

David A. Wagner, Southfield, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 28, 1977, Ser. No. 855,521
Int. Cl.[2] B60K *17/32*
U.S. Cl. 280—708 **11 Claims**



1. A suspension apparatus for the rear wheels of a motor vehicle, the suspension apparatus comprising:

A. a pair of rearward extending control arms;

B. means for mounting one end of each of said control arms for pivotal movement about an axis transverse the longitudinal axis of said vehicle;

C. means for rotatively supporting said vehicle rear wheels at the other end of said control arms;

D. a cross member of generally U-shaped, downward opening cross section having a generally horizontal base portion and a pair of side portions extending downwardly from said base portion, said cross member extending transversely between and fixedly secured to said control arms, positioned longitudinally intermediate said control arm ends;

E. means of defining a pair of gusset plates extending inwardly toward the longitudinal center line of said vehicle from said control arms and fixedly secured to the bottom edges of said cross member side portions; and

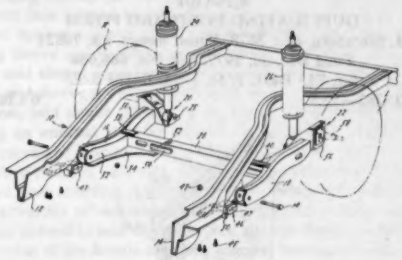
F. reinforcing means positioned within said U-shaped cross member to vary in a regular predetermined manner the torsional stiffness of said cross member along portions of the longitudinal axis of said cross member adjacent the inner edges of said gusset plates.

4,165,099

REAR SUSPENSION APPARATUS FOR A MOTOR VEHICLE

David A. Wagner, Southfield; Daniel W. Doran, Troy, and Robert C. Emenaker, Mt. Clemens, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 28, 1977, Ser. No. 855,499
Int. Cl.[2] B60K *17/32*
U.S. Cl. 280—708 **6 Claims**



1. A suspension apparatus for the rear wheels of a motor vehicle, the suspension apparatus comprising:

A. a pair of rearward extending control arms;

B. means for mounting one end of each said control arms for pivotal movement about an axis transverse to the longitudinal axis of said vehicle;

C. means for rotatively supporting said vehicle rear wheels at the other end of each of said control arms; and

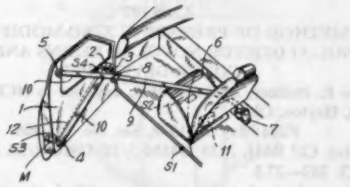
D. a cross member extending transversely between said control arms, positioned longitudinally intermediate said ends, and defining a beam cross section so located with respect to said control arm pivotal axis and so configured that said cross member has a shear center positioned in a transverse plane located above said control arm pivotal axis.

4,165,100

SAFETY BELT APPLYING SYSTEM

Juichiro Takada, Shin'machi, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1977, Ser. No. 849,390
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—802 **8 Claims**



1. In a vehicle including a door swingable about its front end between open and closed positions and an adjacent seat, a safety belt seat system comprising a belt retractor disposed at the side of said seat opposite to said door, a retractor belt retractable by said retractor, a first belt belt guide carried by said retractor belt, a second belt guide mounted on said door and movable along an inclined path from the inner portion thereof downwardly toward the outer portion thereof, a continuous shoulder and waist restraint belt having a first end anchored to said door proximate the upper outer portion thereof and extending therefrom successively through said first and second belt guide and having its other end anchored to said door proximate the lower outer portion thereof, and means including a motor carried by said door and means for activat-

ing said motor in response to the closing of said door for advancing said second belt guide from the upper to the lower end of said path and in response to the opening of said door to retract said second belt guide from the lower to the upper part of the said path.

4,165,101

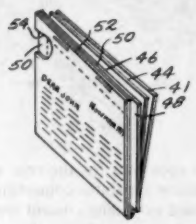
DUPLICATING POSTCARD FORM

Hans J. Sternberg, Box 3478, Baton Rouge, La. 70821

Filed Dec. 30, 1977, Ser. No. 866,064

Int. Cl.[2] **B41L** *1/16, 1/36;* **B41M** *5/22*

U.S. Cl. 282—27.5 **6 Claims**



1. A duplicating form for obtaining two-sided copying of information comprising:

(a) a first post card sheet wherein one side of said first sheet is treated with a color developer of a two-component pressure sensitive chemical system;

(b) a second sheet wherein one side of said second sheet is treated with a color former of a two-component pressure sensitive chemical system, and with said one side of said second sheet facing said one treated side of said first sheet; and

(c) a carbon sheet removably disposed between said first sheet and said second sheet, said carbon sheet having an image-reproducing side facing said one side of said second sheet.

4,165,102

METHOD OF PREPARING ZINC-MODIFIED PHENOL-ALDEHYDE NOVOLAK RESINS AND USE AS A COLOR-DEVELOPER

Jerome R. Bodmer, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Filed May 31, 1978, Ser. No. 911,208

Int. Cl.[2] **B41L** *1/36;* **B41M** *5/16;* **C08G** *8/28, 8/32*

U.S. Cl. 282—27.5 **25 Claims**

1. A method of making a zinc-modified phenol-aldehyde novolak resin which comprises mixing together and heating a solid particulate zinc compound selected from the group consisting of zinc oxide and zinc carbonate, ammonium benzoate in solid particulate form, and a phenol-aldehyde novolak resin material.

18. A pressure-sensitive record material comprising a first substrate having a coating of pressure rupturable capsules containing an oily solution of a substantially colorless chromogenic material and in face-to-face relationship therewith a second substrate having a coating comprising a zinc-modified phenol-aldehyde novolak resin prepared in accordance with the method of claim **1**.

21. A manifold assembly comprising a plurality of coated first and second substrates as defined in claim **18**.

4,165,103

METHOD OF PREPARING ZINC-MODIFIED PHENOL-ALDEHYDE NOVOLAK RESINS AND USE AS A COLOR-DEVELOPING AGENT

Jerome R. Bodmer, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Filed May 31, 1978, Ser. No. 911,209

Int. Cl.[2] **B41L** *1/36;* **B41M** *5/16;* **C08G** *8/28, 8/32*

U.S. Cl. 282—27.5 **25 Claims**

1. A method of making a zinc-modified phenol-aldehyde novolak resin which comprises mixing together and heating a solid particulate zinc compound selected from the group consisting of zinc oxide and zinc carbonate, ammonium formate in solid particulate form, and a phenol-aldehyde novolak resin material.

18. A pressure-sensitive record material comprising a first substrate having a coating of pressure rupturable capsules containing an oily solution of a substantially colorless chromogenic material and in face-to-face relationship therewith a second substrate having a coating comprising a zinc-modified phenol-aldehyde novolak resin prepared in accordance with the method of claim **1**.

21. A manifold assembly comprising a plurality of coated first and second substrates as defined in claim **18**.

4,165,104

SEALED JOINT PIPE CONNECTION

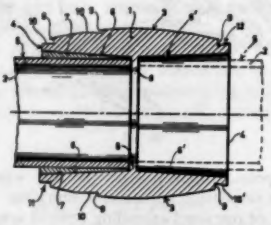
Paul C. H. van den Beld, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Continuation-in-part of Ser. No. 464,685, Apr. 26, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,342

Claims priority, application Netherlands, Apr. 27, 1973, 7305985

Int. Cl.[2] **F16L** *47/00*

U.S. Cl. 285—21 **5 Claims**

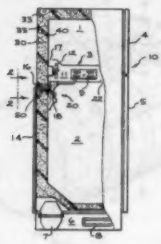


1. A heat sealed pipe connection for pipe parts of a synthetic thermoplastic material particularly polyethylene and polypropylene comprising at least one female pipe part and a male pipe part which is sealed to the inside of the female pipe part by pushing the male pipe part through an end opening into the female pipe part in a non-rotative way, said female pipe part having adjacent its ends annular centering abutment projections on its outside surface, the abutment surfaces of the centering projections being substantially perpendicular to the longitudinal axis of the female pipe part and each centering projection constituting a continuous abutment surface to facilitate gripping of the female pipe part to align the male and female pipe parts, said centering abutment projections adjoin cylindrical bearing surfaces extending in the longitudinal direction of the female pipe part and said cylindrical bearing surfaces extend as far as the nearest opening of the female pipe part, the end of said male pipe part sealed to the female pipe part being inwardly of said abutment projections with respect to the end opening.

4,165,105
CABINET TRANSITION SLEEVE

Thomas M. Hahn, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 27, 1977, Ser. No. 864,970
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—19 9 Claims



1. A transition sleeve for use in a refrigerator cabinet or the like having insulation contained in a cavity formed by first and second walls of said cabinet, the walls having first and second juxtaposed openings formed therein of dissimilar diameters through which tubing or the like may pass, said sleeve comprising:

a unitary tubular body of a relatively rigid material;

mounting means formed at one end of said body for securing the body to one of said openings in one of said walls, said mounting means including a plurality of locking tabs adapted to telescope through said opening for rotation thereabout;

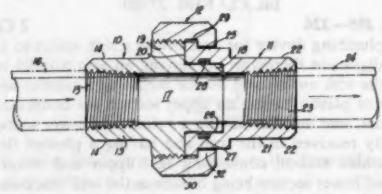
one end of said body including a first annular flange having a diameter less than said first opening but greater than said second opening and adapted to circumferentially seal said second opening on the cavity-side thereof;

a second annular flange at the other end of said body having a diameter greater than said first opening and adapted to circumferentially seal said first opening on the non-cavity-side thereof when said body is secured to the walls by said mounting means, said second annular flange having a plurality of mounting tabs formed integrally therewith and projecting generally axially thereof to provide gripping means for rotational movement of the tubular body.

4,165,106
HOSE OR PIPE COUPLING

James B. Gladden, 1146 King Industrial Dr., Marietta, Ga. 30062

Filed Sep. 26, 1977, Ser. No. 836,491
Int. Cl.[2] F16L *19/02*
U.S. Cl. 285—39 3 Claims

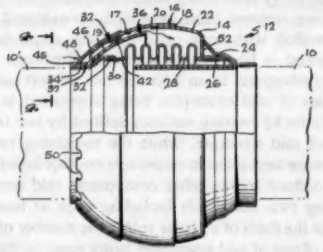


1. A leak-proof high pressure coupling for hoses or pipes comprising telescopically interfitting male and female coupling elements defining in assembled relationship a through passage for fluid, a compressed ring seal disposed between the telescopically interfitting parts of said male and female coupling elements, said telescopically interfitting parts having a sliding fit, abutment faces on said male and female coupling elements arranged in positive engagement when said male and female coupling elements are fully engaged telescopically, thereby providing a sealing effect by at least four abutting faces free of any interposed gaps, screw-threads on the exterior of one of said coupling elements, and a threaded coupling collar engageable with said screw-threads and having a flange for abutment with the other coupling element to releasably hold said abutment faces in positive engagement, thereby providing an additional sealing effect by at least two more abutting faces free of any interposed gaps, said male coupling element having a leading cylindrical sleeve including a first annular end abutment face normal to said sleeve, the female coupling element also having a sleeve portion telescopically receiving said leading sleeve and having a second annular abutment face normal to said sleeve portion and extending from the internal surface of said sleeve portion to the bore of said female coupling element, said sleeve portion of the female coupling element having an internal annular groove receiving said ring seal, said compressed ring seal being disposed between said sleeve and sleeve portion, said ring seal being a rubber-like O-ring seal, said male coupling element having an enlarged theaded portion rearwardly of said sleeve defining a third annular abutment face normal to said sleeve, and an annular flange on said sleeve portion of the female coupling element having a fourth annular end abutment face normal to said sleeve portion and in opposing relationship to said third abutment face, said theaded coupling collar flange engaging rearwardly of the flange on the female coupling element to hold said additional abutting faces in positive sealing contact, the parts being so proportioned that when said flange on the female coupling element is so held, the said telescopically interfitting parts will be held in full telescoping relationship with said first and second faces and said third and fourth faces in positive sealing abutting engagement, and the bores of the male and female coupling elements having screw-threads to receive threaded pipe sections or threaded hose fittings.

4,165,107
FLEXIBLE BALL JOINT

Stephen N. Affa, Torrance, and Roy E. Yorke, Granada Hills, both of Calif., assignors to General Connectors Corporation, Burbank, Calif.

Filed Nov. 22, 1977, Ser. No. 853,855
Int. Cl.[2] F16L *27/04*
U.S. Cl. 285—41 5 Claims



1. A flexible ball joint of the class described comprising a thin walled first portion adapted to be connected to a first duct and a thin walled second portion adapted to be connected to a second duct, said first and second portions connected together by a thin walled flexible bellows to prevent leakage between said first and second thin walled portions when hot gases flow through said first and second duct, said first portion being at least in part spherically concave and serving as a socket, said second portion being at least in part spherically convex and serving as a ball, said first and second portions disposed so said spherical ball nests inside said concave spherical socket so that the first and second thin walled portions can angulate freely, a thin walled ring shaped support, said support having a convex

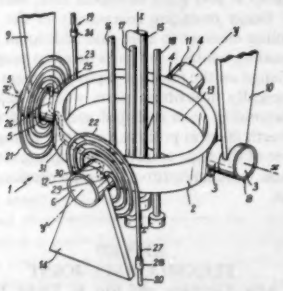
spherical outer surface and a concave spherical inner surface, said support rigidly secured to the concave surface of said first portion and in continuous engagement therewith to reinforce said first portion, a plurality of low friction buttons mounted on said support, said buttons being of the type whose coefficient of friction at least does not increase over the temperature range up to the melting point of steel, said buttons mounted on said support in such a way that a surface of the buttons bears against the convex ball to provide a low friction connection between the first and second portions to permit them to pivot freely with respect to each other over a wide range of temperatures up to the melting point of steel.

4,165,108

DEVICE FOR CONNECTING TUBES HAVING A SMALL CROSS-SECTION PERPENDICULARLY TO A UNIVERSAL COUPLING ELEMENT

Jacques de Saint-Palais, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Jan. 12, 1978, Ser. No. 868,973
Claims priority, application France, Jan. 14, 1977, 77 01095
Int. Cl.[2] F16L *39/04*
U.S. Cl. 285—45 **7 Claims**



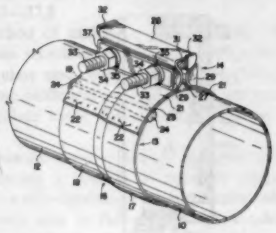
1. A device for connecting two tubes having a small cross-section perpendicularly to a universal coupling element which connects to each other a first component and a second component of an articulated marine structure, said tubes being associated respectively to said first and second structure, said universal coupling element being essentially constituted by a solid core provided with four cross-pins the respective axes of which extend in four respective radial directions any one of which is orthogonal to an adjacent one of said axes, two opposed ones of said cross-pins being supported in respective contact zones by bearing surfaces defined by one of said components of said structure, while the remaining two opposed cross-pins are supported in respective contact zones by bearing surfaces defined by the other component, said device further comprising two assemblies including each at least one tube element in the form of a planar spiral, the number of spiral tube elements of one of said assemblies being equal to the number of spiral tube elements of the other assembly, each one of said spiral tube elements being arranged centrically about the respective axes of two orthogonally disposed cross-pins of said universal coupling element, each spiral tube element having an inner end connected to the orifice of a conduit provided in the associated cross-pin, any two of the conduits provided in said cross-pins being connected to each other by a respective conduit integral with said core, said spiral tube elements further having each an outer end, the outer end of one spiral tube element being connected to the tube with said first component, while the outer end of the other spiral tube element is connected to the tube associated with the second component of said marine structure.

4,165,109

WIDE-BAND COMPRESSION COUPLING

Sam J. Foti, Lyndhurst, Ohio, assignor to Federal Hose Manufacturing Corp., Painesville, Ohio

Filed Jan. 3, 1978, Ser. No. 866,217
Int. Cl.[2] F16L *21/00*
U.S. Cl. 285—177 **7 Claims**



1. A compression coupling for fitting around cylindrical objects, which comprises:

a sleeve assembly extending circumferentially around the cylindrical objects, the assembly having a crown projecting radially outwardly and extending parallel to the longitudinal axis, a channel being formed within the crown;

clamping means at the crown to tighten the sleeve assembly around the cylindrical objects, the clamping means comprising:

a pair of opposed spacer members extending axially on each side of the crown, each of the spacer members having an inner camming surface,

a center member within the channel of the crown interposed between the spacer members, the center member having a camming surface, the center member adapted to be forced radially outwardly by indirect engagement of the camming surface of the center member by the camming surfaces of the spacer members when the spacer members are drawn together, and

fastener means inserted through the spacer members and the crown and positioned radially inwardly of the center member for drawing the spacer members together and for forcing the center members radially outwardly to tighten the sleeve around the cylindrical objects.

4,165,110

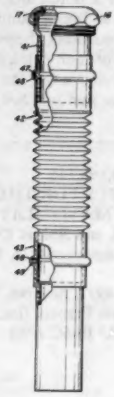
PLUMBING DEVICE

Daniel Itzler, 370 Chestnut Dr., Roslyn, N.Y. 11576

Continuation of Ser. No. 668,964, Mar. 22, 1976, Pat. No. 4,081,190, which is a continuation-in-part of Ser. No. 551,294, Feb. 20, 1975, abandoned. This application Mar. 27, 1978, Ser. No. 890,336
The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.
Int. Cl.[2] F16L *27/00*
U.S. Cl. 285—226 **2 Claims**

1. A plumbing device for connecting a sink outlet to a trap out of alignment therewith but having an axis parallel to the axis of the sink outlet, said device including a tubular unitary member of plastic having an upper section for connection to said outlet, said member having a cylindrical lower section to be snugly received in the trap and having a pleated flexible blow-molded section connecting said upper and lower sections, said lower section being of substantial wall thickness and being rigid so that it can be cut with a hacksaw while said lower section is held in the hand and so that it can resist compression by seal-forming means of the trap, the wall thickness of said pleated section being a minor fraction of the wall thickness of the lower section, the wall of said blow-molded pleated section comprising substantially less material per inch along its axis in its molded condition than the amount of material per inch along the axis of said lower section for enhancing the

pliability of said pleated section, said upper section adjacent to said pleated section being cylindrical and having an external diameter of about 1¼ inches to 1½ inches said pleated section being about 2 to 5 inches long and being capable of being distorted so that said upper section and said lower section



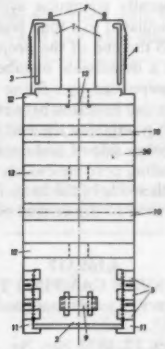
connected thereto may be maintained out of alignment but parallel, said lower section being about 4 to 8 inches long and being cylindrical and having an external diameter of about 1¼ to 1½ inches, said plastic member being of polyolefin resistant to alkaline drain cleaners.

4,165,111

COLLAR FOR GAS PIPELINES

Gianni Zanichelli, Milan, Italy, assignor to RACI S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 747,018, Dec. 3, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,445
Claims priority, application Italy, Jul. 1, 1977, 25340 A/77
Int. Cl.² E16L *21/06*
U.S. Cl. 285—419 **13 Claims**



1. A collar for fitting onto a pipe in the form of a flexible band comprising:

(a) a male end possessing two rows of teeth which lie parallel to the band axis and extend outwardly and laterally in respect to the band;

(b) an opposite end which provides two individual rows of meshing teeth for accepting and securing the toothed male end; and

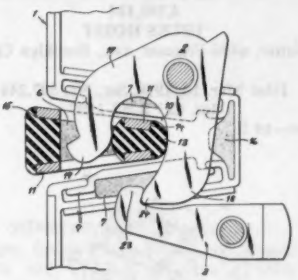
centering ribs which traverse the width of the collar and which are positioned normal to the band axis.

4,165,112

MOTOR-VEHICLE DOOR LATCH

Frank Kleefeldt, Heiligenhaus, Fed. Rep. of Germany, assignor to Arn. Kiekert Söhne, Heiligenhaus, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,949
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725345
Int. Cl.² E05C *3/26*
U.S. Cl. 292—216 **10 Claims**



1. A motor-vehicle door latch comprising:

a latch housing mountable on a motor-vehicle door;

at least one elastomeric guide in said housing forming therein an outwardly opening and outwardly flared seat having a pair of relatively inclined sides;

a locking fork pivotal in said housing between a freeing position clear of said seat and a locking position extending at least partially across said seat; and

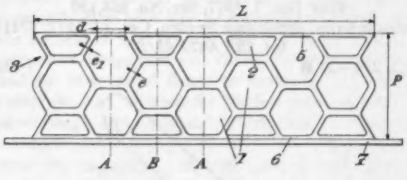
a bolt mountable on a motor-vehicle doorpost and formed of a U-section metal plate having a pair of legs inclined like said sides toward each other inwardly toward said housing and a bight joining said legs, said bolt being snugly fittable within said seat with said legs snugly engaging said sides, at least one of said sides being formed with a recess in which said fork is engageable in said locking position.

4,165,113

MULTICELLULAR ELASTOMERIC SHOCK-ABSORBING DEVICE

Christian Casse, Paris, France, assignor to Paulstra, France

Continuation of Ser. No. 760,350, Jan. 18, 1977, abandoned. This application May 22, 1978, Ser. No. 908,140
Claims priority, application France, Jan. 27, 1976, 76 02141
Int. Cl.² B60R *19/06*; F16F *1/36, 1/44*
U.S. Cl. 293—121 **10 Claims**



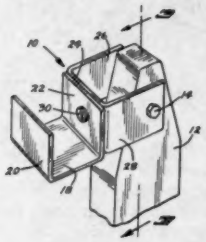
1. A multi-cellular shock absorbing device for absorbing shocks transmitted between first and second members in a given direction, said device having a top and a bottom and comprising a plurality of interdependent three-dimensional elastomeric cells arranged in a honeycomb pattern and affixed to one of said members, each said cell having a longitudinal axis, being polygonal in transverse cross section, having side walls, and being disposed such that, in use, the longitudinal axis thereof extends vertically, transversely to the direction of the shocks to be absorbed the side walls of the cells of said honey-

comb pattern being continuous from the top of the device to the bottom thereof so that, in use, said device, as viewed in the direction of the shocks to be absorbed, is formed by a single row of vertically extending cells, and the arrangement of said cells including at least two complete cells arranged serially in the direction of the shocks to be absorbed and at least one complete cell and two half cells arranged serially in said direction and formed ingetrally with, and disposed laterally of, said two complete cells.

4,165,114
TRUSS HOIST

Larry L. Nutter, 6436 Fremont Ave., Brooklyn Center, Minn. 55430

Filed Mar. 16, 1978, Ser. No. 887,244
Int. Cl.[2] B25J *1/00*
U.S. Cl. 294—19 R **9 Claims**



1. A truss hoist for use in gripping, raising and supporting a prefabricated structural member comprising:

a. a first U-shaped means for gripping, raising, and positioning a prefabricated structural member;

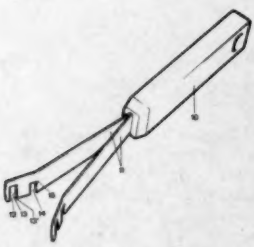
b. a second U-shaped means having means rotatably mounting said second U-shaped means to a rectangular support member; and,

c. a swivel fastening means fastening one leg of said first U-shaped means to the base of said second U-shaped means whereby said first U-shaped means grips, raises, and positions said prefabricated structural member while said second U-shaped means is rotatably mounted to said rectangular member, and said rectangular member being held, raised and supported by an individual during construction of a building.

4,165,115
JAR HOLDER

Rune J. Olsson, Höllviksnäs, Sweden, assignor to Produnik AB, Malmo, Sweden

Filed Dec. 7, 1977, Ser. No. 858,150
Claims priority, application Sweden, Oct. 12, 1977, 7711455
Int. Cl.[2] A47J *45/10*
U.S. Cl. 294—27 R **7 Claims**

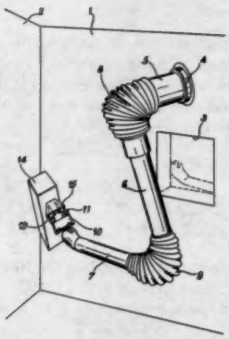


1. A container holder for handling containers having a peripheral outwardly-extending rim at an opening thereinto for retaining a cap over the opening, comprising a handle, holder means carried at one end by the handle comprising two resilient elongated planar metal strips extending outwardly from the handle at a diverging angle to each other and resiliently resisting displacement towards each other sufficiently to be in contact with each other; each strip having formed therein at a lower edge portion thereof a notch shaped for receiving an external portion of the rim at the opening of the container at circumferentially spaced locations thereof; and a serration formed along one side edge of each notch for engagement with the external portion of the rim, when the strips are displaced towards each other to move said notches towards each other and then released.

4,165,116
GRIPPING APPARATUS FOR THE TONGS OF A REMOTE MANIPULATOR

Jean-Claude Baudoin, Paris, and Robert Oger, Antony, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 17, 1977, Ser. No. 852,467
Claims priority, application France, Dec. 3, 1976, 76 36486
Int. Cl.[2] B66C *1/66*
U.S. Cl. 294—86 R **8 Claims**



1. A gripping apparatus for the tongs of a remote manipulator having two generally triangular symmetrical elongated projections, each articulated to a tong body and having a rear end piece opposite to the end of the projection, wherein said apparatus comprises a detachable member which is fixed to each object to be manipulated by a fixing means and having a central portion which can be seized between the projections of the tongs, a supporting edge for the end piece of the projections projecting on either side of said central portion and two parallel flanges extending perpendicularly to the plane of said central portion on either side of the latter in order to cover the tong projections fastened to the central portion.

4,165,117
COLLAPSIBLE CAMPING TRAILER

Jarome Kaiser, Calgary, Canada, assignor to Gabor Nadhazi, Calgary, Canada

Filed Oct. 22, 1974, Ser. No. 327,753
Int. Cl.[2] B60P *3/34*
U.S. Cl. 296—27 **7 Claims**

1. A collapsible camping trailer body for a wheeled trailer frame comprising:

(a) a lower box portion including a floor, two upstanding side walls, and two upstanding end walls, said walls being rigidly connected to said floor,

(b) outer wall members hingedly connected to the top edges of each of said side walls along substantially the entire length thereof,

(c) each of said outer wall members comprising a first panel

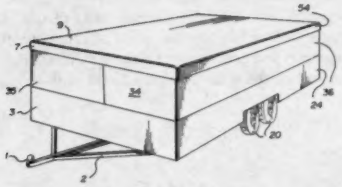
joining the side wall at the hinge connection, a second panel fixed at substantially a right angle to said first panel, a pair of end panels rigidly secured to said first and second panels at the ends thereof and at right angles to each of said first and second panels, and a third panel hingedly connected to the upper longitudinal edge of said second panel,

(d) a roof member of substantially the same length and width dimensions as said lower box portion said roof member including a substantially planar panel serving as the outer roof of said camping trailer both in expanded and collapsed positions,

(e) the upper edge of said third panel being hingedly connected to said roof member along said edge,

(f) triangular filler panels hingedly connected to each of the end edges of said third panels,

(g) said outer wall members forming extension rooms wherein said first panel comprises the bottom, said second



panel comprises a wall, and said third panel comprises a sloping roof, and said end panels and filler panels comprise front and rear walls of said extension rooms when opened,

(h) front and rear trailer end walls hingedly connected to said roof member,

(i) jack means for raising and lowering said roof member and thereby opening or collapsing said extension rooms and whereby said roof may be raised from a first, closed position to a second fully elevated position when said extension rooms are partially opened to a third partially elevated position when said extension rooms are fully opened,

(j) said first panels forming vertical side walls, said second panels and third panels being in face-to-face juxtaposition and said end panels forming front and rear walls when said trailer is collapsed,

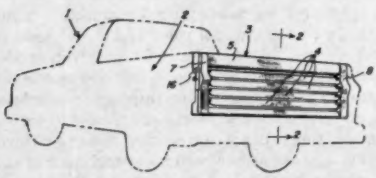
(k) said front and rear trailer end walls being in face-to-face juxtaposition with said roof when said trailer is collapsed.

4,165,118

LOUVERED TAILGATE WITH AUTOMATICALLY ADJUSTABLE VANES

Edward A. Jensen, Salem, S. Dak., assignor to Jenerl, Inc., Salem, S. Dak.

Filed Dec. 20, 1977, Ser. No. 862,657
Int. Cl.[2] B62D *35/00*
U.S. Cl. 296—50 **4 Claims**



1. A drag reducing and vision augmenting device for a pickup truck comprising:

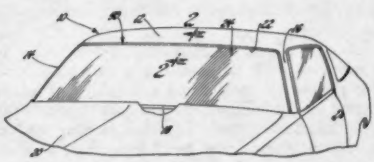
a tailgate for mounting at the rear of a pickup bed, said tailgate having a plurality of louvers, each of said louvers being pivotable about a horizontal axis between an open position and a closed position, said louvers being substantially vertical when in said closed position and each of said louvers having more frontal area below its respective axis than above its respective axis such that when said truck is in motion, air pressure buildup in said bed will cause said louvers to move to said open position so as to relieve said pressure buildup in said pickup bed and such that when said truck is at rest, gravity will cause said louvers to assume said lowered position, said louvers being spaced so as to allow vision therebetween from the cab of said pickup when said louvers are in said closed position.

4,165,119

WINDOW REVEAL MOLDING

Carl E. Hedeen, Grosse Pointe Shores, and Richard D. Loose, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1977, Ser. No. 854,142
Int. Cl.[2] B60J *1/02*
U.S. Cl. 296—93 **1 Claim**



1. In a motor vehicle body, a molding for concealing the space between a flange body panel and the edge of a window panel mounted on the body panel flange by a curable adhesive, said molding comprising:

a decorative trim portion adapted to bridge the space between the window panel and the body panel in overlying engagement therewith;

a resiliently yieldable stem extruded integral with the decorative trim portion and extending generally normal therefrom for insertion into the space between the window panel and body panel;

a bulbous enlargement integral with the stem at the free end thereof and adapted to project into the curable adhesive to attach the molding to the vehicle body;

a plurality of resiliently yieldable retrorse fins extending outwardly from both sides of the stem and angled toward the decorative trim portion, said fins being adapted for respective engagement with the edge of the window panel and the body panel flange to resiliently and yieldably center the stem between the window panel and the body panel flange, said resiliently yieldable stem and fins cooperating to permit tilting of the decorative trim portion into overlying engagement with the window panel and body panel irrespective of the mounting of the window panel in a plane disparate from the body panel, the fins on each side of the stem providing serially arranged dams, each successive pair of such fins cooperating with the stem and the respectively engaged panel to provide a reservoir for capture of adhesive overflowing the terminal fin of such successive pair to thereby prevent flow of the adhesive onto the molding and the panels upon insertion of the bulbous enlargement of the stem into the adhesive and displacement of such adhesive into the space between the panels.

4,165,120

VEHICLE ROOF

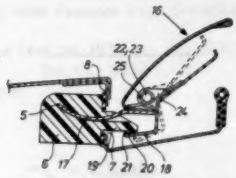
Hans Jardin, Inning; Wolfgang Rottenfusser, Hanfeld, and Karl-Heinz Isleif, Percha, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Nov. 2, 1977, Ser. No. 847,910

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 7635933[U]

Int. Cl.[2] B60J *7/18*

U.S. Cl. 296—137 J **12 Claims**



1. Vehicle body apparatus comprising:

vehicle body panel means,

an opening formed in said body panel means,

receiving element means disposed adjacent said opening,

a cover member for selectively closing said opening,

a wind deflector which is separate from said cover member and which is attachable at said body panel means adjacent said opening,

wherein each of said cover member and said wind deflector is provided with similarly configured plug-in elements, said plug-in elements being releasably connectible with mating plug-in elements of said receiving element means to accommodate easy interchangeability and optional utilization of said cover member and said wind deflector in conjunction with said opening, and

safety means secured to the underside of at least one of said cover member and wind deflector for preventing inadvertent detachment thereof, said safety means being detachably fastenable to said receiving element means in a manner enabling easy connection and disconnection thereof.

4,165,121

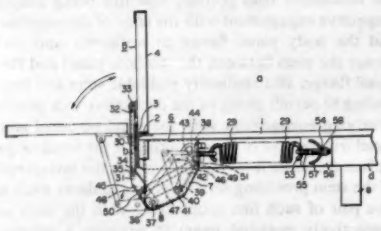
DEVICE FOR OPENING AND CLOSING A SIDE PLATE OF A LOADING BOX ON A MOTOR TRUCK UNDER NO-LOAD CONDITION

Masaki Hori, Tokyo, and Hisashi Hori, Yokohama, both of Japan, assignors to Jidosha Seiko Co., Ltd., Tokyo, Japan

Division of Ser. No. 672,308, Mar. 31, 1976, abandoned. This application Aug. 31, 1977, Ser. No. 829,455

Int. Cl.[2] B60J *5/10*

U.S. Cl. 296—57 A **3 Claims**



1. A device for opening and closing a side plate of a loading box on a motor truck under no-load condition, the side plate being outwardly openably hinged at its bottom edge to the outer side edge of the floor plate of said loading box, said device comprising an interlocking mechanism consisting of two upper and lower actuating connecting rods and twice-foldably articulated to a point on the outer surface of said side plate and to the lower portion of a support arm downwardly depending from the underside of said floor plate, said interlocking mechanism being resiliently pulled by a pull spring downwardly and sidewise of said floor plate to hold said side plate in equilibration, said upper actuating connecting rod having the upper end thereof articulated to said point on the outer surface of said side plate and having the lower end thereof articulated to the upper end of said lower actuating connecting rod, the lower end of said lower actuating connecting rod being articulated to the lower portion of said support arm, a flicking arm rod having the lower end thereof articulated to the upper portion of said support arm, the upper end of said flicking arm rod being engaged with the forward end pulling portion of said pull spring, and a control connecting rod having the opposite ends thereof articulated to intermediate portions of said lower actuating connecting rod and said flicking arm rod, respectively, the pull force of said pull spring being adjustable by changing the point of articulation between said flicking arm and said support arm or by changing the point of engagement of the base portion of said pull spring.

4,165,122

MOTOR VEHICLE BODY WITH A RIGID SUNSHINE ROOF

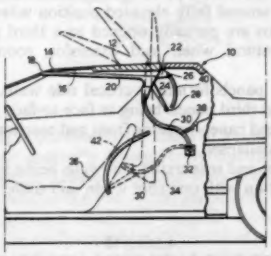
Giuseppe Bertone, Turin, Italy, assignor to Carrozzeria Bertone S.p.A., Grugliasco, Italy

Filed Oct. 21, 1977, Ser. No. 844,169

Claims priority, application Italy, Nov. 2, 1976, 69625/76

Int. Cl.[2] B60J *7/24*

U.S. Cl. 296—107 **4 Claims**



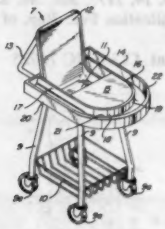
1. In a motor vehicle having a body, seats with back rests, a space behind said back rests and a sunshine roof including a separate rigid roof panel movable between a first closed position in which said panel is disposed in a substantially horizontal plane and a second open position in which said panel is disposed in the space behind said back rests, the improvement comprising supporting means pivotally connected both to the vehicle body and to the roof panel and guide means on said vehicle body and said roof panel for positively guiding the movement of said panel between its first and second positions for compelling said panel to be disposed in a substantially vertical position when said panel is disposed in its second open position; said supporting means is comprised of two lever arms disposed at opposite sides of said roof panel, each of said arms having one end pivotally connected to said panel and the opposite end thereof pivoted to said vehicle body for pivotal movement about a horizontal transverse axis located behind said back rests and said guide means is comprised of at least one curved guide rail fixed to the vehicle body at one side of the roof panel and a complimentary guide engaging element on said panel adapted to operatively engage said guide rail.

4,165,123

HIGH CHAIR APRON

Howard A. Hutson, P.O. Box 1415, Denver, Colo. 80201

Filed Feb. 21, 1978, Ser. No. 879,137
Int. Cl.[2] A47D *15/00*
U.S. Cl. 297—153 8 Claims



1. A disposable apron for a high chair, said high chair having a seat, chair back, and arms with a tray supported on said arms, said apron comprising

(a) a generally planar surface member which is positioned to overlie and be supported by said tray,

(b) a trough means positioned around at least three edges of said planar surface member and having a pair of ends, said trough means being arranged to catch and hold food or liquids which are dropped by a child sitting in the high chair,

(c) means for securing said apron to said high chair, said securing means being attached to the trough means at a location near the back of said chair and arranged to extend behind said back to secure the apron, and

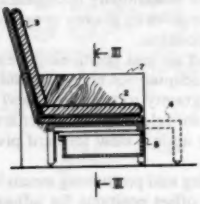
(d) a narrow rim surface disposed between said planar surface member and said trough means, said narrow rim surface being elevated slightly above said surface member to form a ridge around at least three edges of the surface member.

4,165,124

COMBINATION OF CHAIR AND APPAREL CABINETS

Jose A. Olan, La Quinta K-15 St. #5, Yauco, P.R. 00768

Filed May 15, 1978, Ser. No. 906,043
Int. Cl.[2] A47C *7/62*
U.S. Cl. 297—190 4 Claims



1. A combination of chair and apparel cabinets, comprising

a chair having a frame, an upholstered seat supported by the frame at a distance above a floor and an upholstered back rest supported by the frame in fixed position and extending substantially upright behind the seat;

a footrest slidably mounted on the chair frame beneath the seat for movement to a stored position under the seat and to an extended position for supporting the feet of a person seated in the chair;

an apparel container slidably mounted on the chair frame beneath the footrest for movement to a stored position under the footrest and the seat and to an extended position for exposing said container to access by a user;

a first apparel cabinet extending along one side of the chair and positioned substantially perpendicularly to the seat and back rest thereof; and

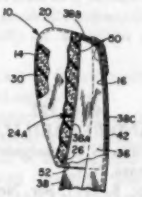
a second apparel cabinet extending along the opposite side of the chair and positioned substantially perpendicularly to the seat and back rest thereof in substantially parallel relation with said first apparel cabinet, at least one of said first and second apparel cabinets having a height dimension sufficient to form an arm of the chair, each of said first and second cabinets having a back panel abutting said seat and back rest, a front side panel extending to a height at least equal to that of an arm of the chair, a back side panel equal in height to the front side panel in spaced parallel relation with the front side panel and a substantially horizontal top panel.

4,165,125

SLIPOVER HEADREST PILLOW ASSEMBLY

Hugh J. Owen, Mansfield, Ohio, assignor to National Seating Company, Mansfield, Ohio

Continuation-in-part of Ser. No. 805,590, Jun. 8, 1977, abandoned. This application Aug. 8, 1978, Ser. No. 931,900
Int. Cl.[2] A61G *15/00*
U.S. Cl. 297—220 10 Claims



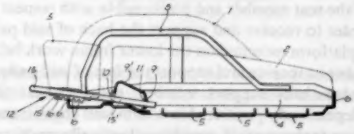
1. In combination with a seat back, a slipover headrest pillow assembly comprising an invaginable, open bottom box-like cover having front, back, top and end walls relative to said seat back, a pillow insert, pocket means along the front wall of said cover having two positions, the first position being exposed on the outside of said cover to facilitate receipt of said pillow insert in said pocket, the second position being inside said cover after said pillow insert has been received and after the cover has been invaginated, and a support compartment formed by the cover between the pillow pocket, top, back and end walls of said cover after invagination, such compartment receiving the top of said seat back when the cover is slipped thereover to support such pillow assembly in a headrest position.

4,165,126

ADJUSTABLE VEHICLE SEAT BOTTOM

Werner Strien, Stuttgart-Heumaden; Rudolph Zwanziger, Erkenbrechtsweiler, and Ernst Kaufmann, Stuttgart, all of Fed. Rep. of Germany, assignors to Recaro GmbH & Co., Kirchheim, Fed. Rep. of Germany

Filed Aug. 15, 1978, Ser. No. 933,952
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 2739999
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—284 6 Claims



1. In a vehicle seat including a seat bottom having upholstery which is divided transversely into front and rear sections,

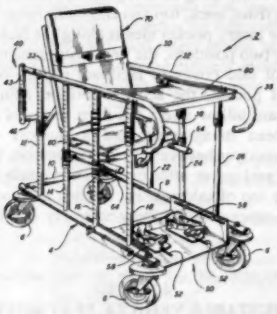
said sections being supported by a front and rear upholstery support respectively, the upholstery supports being adjustably slidable relative to each other, means for latching the upholstery supports in selectable relative positions, the front upholstery support having two parallel rods for supporting the front upholstery section, means for guiding the rods so as to be longitudinally shiftable relative to the rear upholstery support, the improvement wherein said guiding means comprise bores formed in the rear upholstery support for receiving said rods, said bores having dimensions which permit limited upward pivotal motion of the rods, said front upholstery support including a plate, said two rods being attached to said plate, said plate having downwardly directed edge strips extending substantially parallel to the rods, said edge strips having a series of downwardly open notches, said rear upholstery support having a raised front edge, said notches and raised front edge defining said latching means.

4,165,127

THERAPEUTIC AND REHABILITATIVE CARRIAGE

Robert E. Vago, Manlius, N.Y., assignor to Diakinetics, Incorporated, East Syracuse, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,100
Int. Cl.[2] A47C 1/027
U.S. Cl. 297—345 4 Claims



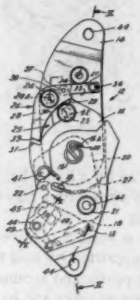
1. A therapeutic and rehabilitative carriage for receiving and transporting an invalided patient comprising a wheeled chassis having horizontal upper and lower framework and a plurality of upright stanchions running between the upper and lower framework to provide a generally cage like structure, a seat member for receiving and supporting the buttocks of a patient mounted on selected stanchions for horizontal, vertical, and angular movement; a back support member mounted independently of the seat member and positionable with respect to said seat in order to receive and support the back of said patient; a foot rest platform mounted on the lower frame work below the seat member to receive and support the feet of said patient; said seat member, back support member, and foot rest platform being independently positionable within said chassis; and movable locking means on said stanchions vertically positionable to secure in selected relative positions said seat member, back rest member, and foot rest platform.

4,165,128

INERTIALLY LOCKED HINGE FOR MOTOR-VEHICLE SEAT

Willibald Strowick, Remscheid-Lennep, and Paul Werner, Remscheid, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Sep. 14, 1977, Ser. No. 833,336
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641587
Int. Cl.[2] A47C 1/025
U.S. Cl. 297—367 10 Claims



1. In a motor-vehicle seat having a seat part and a reclining back part adjustable in any of a plurality of angular positions relative to said seat part, a hinge comprising:

a lower hinge element fixed to said seat part;

an upper hinge element fixed to said back part;

means for pivotably connecting said upper hinge element to said lower hinge element;

a positioning element pivotal on said lower hinge element and formed with an outwardly open recess having one end forming a stop formation and another end forming an abutment engaging said upper hinge element in a rest position thereof;

an inertial pawl in the form of a two-arm lever pivotal on said upper hinge between a blocking position and a freeing position, one arm of said lever being directed toward said stop formation on said positioning element and having a stop face engageable with said formation when said pawl is in said blocking position, the other arm of said lever being directed substantially horizontally and weighted so as normally to pivot by gravity in one rotational sense into said freeing position;

said another end on said positioning element having a support surface adapted for engaging said other arm against the force of gravity to urge said pawl into said blocking position and for releasing said other arm into said freeing position only upon a slow forward pivoting of said back part; and

means for locking said positioning means in any of a plurality of angularly offset positions for adjusting said rest position.

4,165,129

SHIELD TUNNELING MACHINE AND METHOD

Yoshihito Sugimoto, Kokubunji; Konosuke Miyata, Matsudo; Kanehiro Ishihara, Tokyo; Sachio Fujimoto, Yachiyo, and Tsunehiro Kakutani, Kashiwa, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo and Sato Kogyo Kabushiki Kaisha, Toyama, both of, Japan

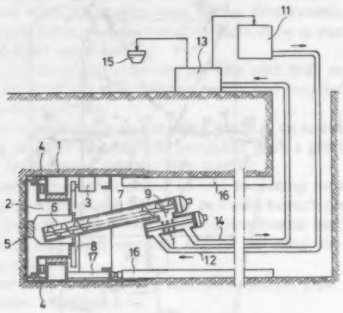
Filed Nov. 17, 1977, Ser. No. 852,308
Int. Cl.[2] E21D 9/08
U.S. Cl. 299—11 11 Claims

1. A shield tunneling machine comprising

(a) a cutter disposed for rotation by motors, maintained in

water-tight relationship with the inner surface of a shield frame with sealing members and formed integral with a water-tight cutter chamber,

(b) a screw conveyor water-tightly connected to said cutter chamber in such a way that the loading opening of said screw conveyor is communicated with said cutter chamber, and



(c) a mucking adjuster for the mixture of muck and water disposed immediately below the unloading opening of said screw conveyor and connected at one end thereof with a water supply pipe and at the other end thereof with a discharge pipe.

4,165,130

IMPACT TUNNELING MACHINE WITH CUTTERS SPACED FOR EQUAL WORK

Warren S. Mason, R.R. 2, Box 179H, Chicago Heights, Ill. 60411

Filed Jan. 5, 1978, Ser. No. 867,024
Int. Cl.² E21D *9/10*
U.S. Cl. 299—62 **8 Claims**

1. A workhead assembly for a tunneling machine comprising:

a shroud means;

a rotatably mounted circular plate adapted to form a closure at the inlet end of said shroud means;

a plurality of cutting tool means arranged in radially spaced series about said plate and projecting forwardly therefrom, said tools being of such number and so arranged in series that the distance traveled by each tool upon rotation of said circular plate divided by the number of tools in that series is generally equal; and

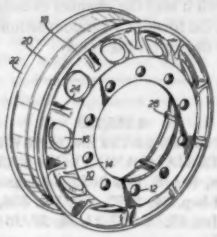
means mounted for rotation with said circular plate means for removing cuttings from the area of the tunnel face as they are formed.

4,165,131

CAST VEHICLE WHEELS

Joseph A. Thompson, Stourbridge, England, assignor to GKN Kent Alloys Limited, England

Continuation-in-part of Ser. No. 628,961, Nov. 5, 1975, abandoned. This application Jul. 7, 1977, Ser. No. 813,571
Int. Cl.² B60B *1/06*
U.S. Cl. 301—65 **4 Claims**



1. A cast vehicle wheel comprising:

a wheel centre comprising a nave having apertures to enable the wheel to be secured to a vehicle hub, and an inclined section extending generally outwardly from the nave and consisting essentially of T-section spokes separated by vent holes; and

a rim portion having a well extending from the outer periphery of said inclined section and

two tire bead seat portions spaced apart by the well;

each said T-section spoke comprising a web extending between the outer face of said inclined section and the adjacent one of the said tyre bead seat portions, said web forming the stem of the T and, forming part of the cross-member of the T,

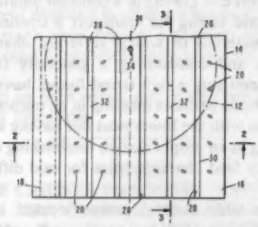
an integral fillet located on the inner face of said inclined section so that the cross-member of the T is thicker at its middle than at its ends which are located at two adjacent vent holes.

4,165,132

PNEUMATIC CONTROL OF THE MOTION OF OBJECTS SUSPENDED ON AN AIR FILM

Javathu K. Hassan, Hopewell Junction, and John A. Paivanas, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,394
The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.
Int. Cl.² B65G *51/02*
U.S. Cl. 406—10 **3 Claims**



1. Apparatus for stopping an object such as a semiconductor wafer as it moves relative to the surface of a track on a fluid film comprising:

strings of openings in the surface of the track along the axis of movement of the wafer across the track to supply fluid for the fluid film,

an exhaust channel which is many times longer than the length of the object being transported and is oriented parallel to the strings of openings in the surface of the track to allow excess fluid from the film to be removed from the track to establish a film for transporting the wafer,

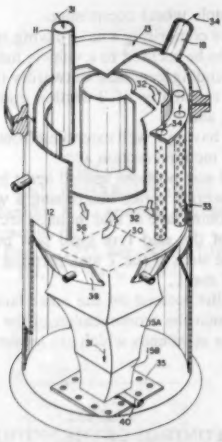
a nozzle emitting a fluid jet in at least one direction along the channel at a sufficient pressure so as to draw fluid from the film along with it into the channel to cause a perturbation in the film in the form of a vacuum around the nozzle that will stop the object on the track.

4,165,133

MATERIAL HANDLING SYSTEM FOR WIDE RANGE OF MATERIALS AND FLOW RATES

Albert O. Johnson, Rte. 8, Box 1052, Livingston, Tex. 77351

Filed Sep. 26, 1977, Ser. No. 836,895
Int. Cl.[2] B65G *53/28, 53/36*
U.S. Cl. 406—109 **10 Claims**



1. A variable output pneumatic conveyor system for transporting a wide range of finely divided, granular and hygroscopic bulk materials through conveyor tubes by pneumatic flow, comprising in combination,

a pneumatic source,

pneumatic tubing coupled with said source to transport by pneumatic flow in the tubing said materials,

material storage means accumulating and introducing primarily by force of gravity at a constant uninterrupted flow rate into said tubing for transport a continuous flow of different materials of widely differing characteristics in said range and constituting a generally funnel shaped hopper comprising a two tiered funnel having two separate hyperbolic surfaces meeting in an outwardly directed intersection with the lowermost tier having a funnel shape terminating at an output throat, establishing constant flow rate gravity feed characteristics for said different materials,

variably selectable control means located in the funnel throat establishing different gravity induced flow rates out of said hopper into said tubing, and

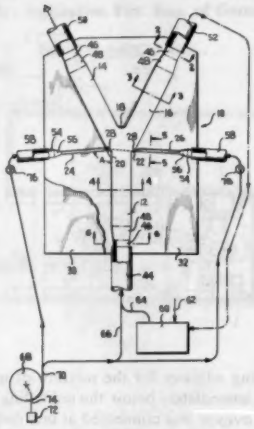
movable valve means between said hopper throat and said tubing for selectively gating upon command said flow of materials into said tubing for transport therein by means of said pneumatic source, said valve means comprising a gating valve which controls the batch flow time so that the flow of material can be metered.

4,165,134

PNEUMATIC POWDER FLOW DIVERTING DEVICE

Robert D. Payne, Countryside, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 16, 1977, Ser. No. 825,240
Int. Cl.[2] B65G *53/16*
U.S. Cl. 406—1 **6 Claims**



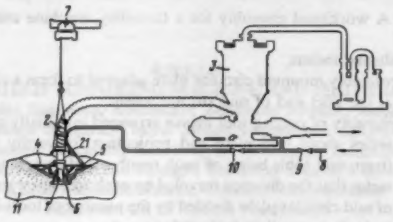
1. A pneumatic powder flow diverting device comprising a powder-gas admixture supply line, a delivery line and a return line for selectively receiving a powder-gas admixture from said supply line, said delivery line and said return line being arranged in a V pattern and in intersecting relation to define an intersection tapering towards said supply line; said supply line, said delivery line and said return line all being of substantially the same cross section adjacent said intersection, said supply line opening directly into said intersection at a point where the intersection is of a width greater than the width of said supply line with there being a shoulder at each side of said supply line, and diverter lines opening into said intersection on opposite sides of said supply line immediately adjacent said shoulders.

4,165,135

METHOD OF UNLOADING BULK MATERIALS FROM VESSELS AND DEVICE FOR IMPLEMENTING SAME

Max M. Shapunov, ulitsa Frunze, 16, kv. 15; Mikhail A. Koppel, ulitsa Vosstania, 22, kv. 18; Felix M. Frumkin, ulitsa Prazhskaya, 34, kv. 93; Evgeny I. Zvenigorodsky, Vladimirsky prospekt, 11/10, kv. 15, all of Leningrad, U.S.S.R., and Antal Gabor, Ifjumunkash 9, Tatabanya U, Hungary

Filed Jan. 23, 1978, Ser. No. 871,394
Int. Cl.[2] B65G *53/42*
U.S. Cl. 406—152 **4 Claims**



1. A device of unloading a bulk material from vessels, comprising:

a sucking nozzle for taking said bulk material to be transported;

a bulk material transportation means connected to said sucking nozzle;

a means for loosening said bulk material being attached to said sucking nozzle and embracing said sucking nozzle so that an inlet opening of said sucking nozzle is disposed below said loosening means;

said loosening means being made as the frustum of a cone installed with its smaller base facing downwards, while the lateral surface of said cone is formed by a number of spaced-apart separate ribs;

a means for supplying aerating air into said bulk material, being attached to said loosening means and installed under said sucking nozzle;

said aerating air supply means being made as an annular tube having an inlet opening and provided with a plurality of outlet holes facing said sucking nozzle;

a pneumatic vibrator attached to said loosening means and having an inlet branch pipe and an outlet branch pipe, said outlet branch pipe of said pneumatic vibrator being connected to said inlet opening of said aerating air supply means; and

a pressure line connected to said inlet branch pipe of said pneumatic vibrator.

4,165,136

CONTROL SYSTEM OF A RAILWAY VEHICLE AIR BRAKING SYSTEM

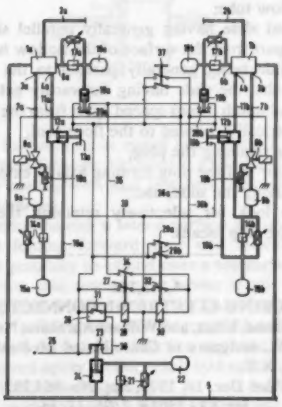
Hans Erlbeck, Unterzolling, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,281

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708273

Int. Cl.[2] B60T *7/14*

U.S. Cl. 303—19 **7 Claims**



1. A control system for an air brake system of a railway vehicle comprising an operator's brake valve connected to an air line and having an operating lever, said brake valve having a control connection, a control output, a control input and pressure regulating means connected to said control output and means for controlling pressure in said air line connected to said control input, connecting means between said control output and said control input including means for establishing a first throttle connection to the atmosphere, a first air tank having a first throttle check valve connected to said control input and a first differential pressure switch one side of which is connected to said control input and the other side connected to said first air tank, said throttle connection establishing means comprising a solenoid valve having an energizing circuit, a second air tank connected through a second throttle check valve to said control connection on said brake valve, a pressure switch connected to said second air tank and held in its open position by the pressure in said second air tank, the pressure in said first air tank acting upon said differential switch in the closing direction thereof, a first delay having a first contact switch connected to said first differential switch and a second contact switch in series with said pressure switch, said first and second contact switches being open when said first relay is deenergized, a second relay having a third contact switch connected in series with said first contact switch and having an energizing circuit connected to said second contact switch, said second relay having a fourth contact switch connected to said solenoid valve, said third and fourth contact switches being open when said second relay is deenergized, and a normally closed condition responsive switch connected to an energizing circuit of said first relay so that opening of said condition responsive switch in response to a predetermined condition deenergizes said first relay to open said first and second contact switches and after a predetermined delay deenergizes said second relay whereupon said fourth contact switch is opened to actuate said solenoid valve to open the throttle connection to the atmosphere thereby decreasing pressure to said control input to actuate said brake valve to reduce pressure in said air line to effect a braking action.

4,165,137

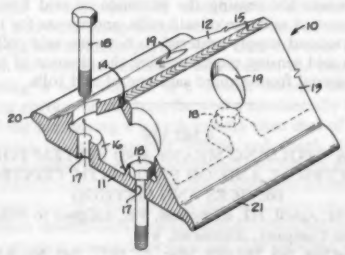
APEX TRACK SHOE AND METHOD FOR MAKING THE SAME

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 26, 1977, Ser. No. 828,005

Int. Cl.[2] B62D *55/28*

U.S. Cl. 305—54 **17 Claims**



1. A track shoe adapted for use in an endless track assembly comprising

a base,

a pair of laterally spaced sidewalls formed integrally with said base and extending away therefrom and towards each other in converging relationship to terminate at end portions thereof disposed in close proximity to each other to define a track shoe having a uniform triangular cross section at least substantially throughout the width thereof, and

a lug formed on each lateral side of said base and extending outwardly therefrom.

4,165,138

DISPENSER CABINET FOR SHEET MATERIAL AND TRANSFER MECHANISM

Russell K. Hedge, Green Bay, and William S. Huss, Appleton, both of Wis., assignors to Mosinee Paper Company, Mosinee, Wis.

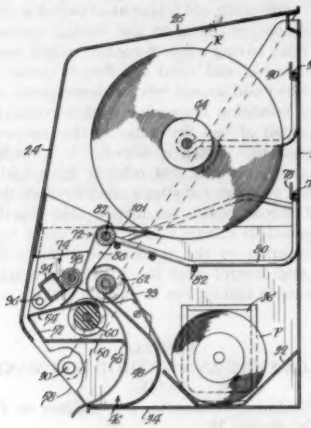
Continuation-in-part of Ser. No. 741,947, Nov. 15, 1976, abandoned. This application Apr. 15, 1977, Ser. No. 787,791

Int. Cl.[2] B65H *19/06*

U.S. Cl. 312—39 **25 Claims**

1. In a dispenser for sequentially dispensing sheet material

from first and second supplies thereof, a feed mechanism for receiving material from either of said supplies and for dispensing said material, and means for sensing the presence of said first supply material at said feed mechanism when feeding said first supply material and for transferring said second supply material to said feed mechanism upon sensing the absence of said first supply material at said feed mechanism, said feed mechanism including a pair of parallel and engaging feed rolls



at least one of which is rotatably driven to dispenser material, said material from said first supply extending around at least a portion of one of said rolls and between said rolls when said material is being fed, said sensing and transferring means including means for sensing the presence of said first supply material around said one of said rolls, and means for transferring said second supply material to between said rolls in response to said sensing means sensing the absence of said first supply material from around said one of said rolls.

4,165,139

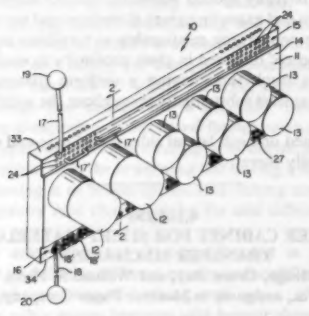
MANIFOLDING MEANS AND SYSTEM FOR ELECTRICAL AND/OR PNEUMATIC CONTROL DEVICES AND METHOD

Clarence M. Asbill, III, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 780,038, Mar. 22, 1977, Pat. No. 4,093,329. This application Feb. 7, 1978, Ser. No. 875,950

Int. Cl.[2] H01R *3/04*

U.S. Cl. 339—15 **10 Claims**



1. In a combination of a manifold means detachably carrying on one side thereof a plurality of control units each of which is pneumatically and electrically operated and each of which is fluidly and electrically interconnected to pneumatic means and electrical means of said manifold means, the improvement wherein said one side of said manifold means has external interconnection means for said pneumatic means and said electrical means whereby external pneumatic and electrical lines can be interconnected to said interconnection means and thereby be interconnected to the same side of said manifold means that said units are interconnected thereto.

4,165,140

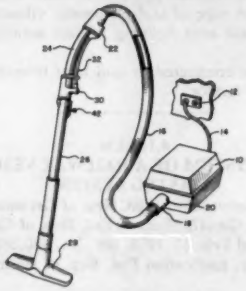
VACUUM CLEANER ATTACHMENT WAND WITH DEMOUNTABLE ELECTRICAL CONNECTOR

John B. Lyman, Bloomington, and Bruce E. Stewart, Maplewood, both of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 17, 1978, Ser. No. 878,733

Int. Cl.[2] H01R *3/04*

U.S. Cl. 339—15 **14 Claims**



1. A floor tool wand for a floor tool of a vacuum cleaner comprising:

a rigid hollow tube;

an elongated slide having generally parallel sides on and spaced apart from the surface of the hollow tube, the axis of the slide being generally parallel to the axis of the hollow tube, the slide having outwardly extending stop means and notch means spaced apart from the stop means;

a plug electrically coupled to the floor tool;

a connector retaining the plug;

the connector and the plug forming axially extending channels receiving the slide; and

a movable lock for selectively retaining the connector against the stop means.

4,165,141

LOCKING ELECTRICAL CONNECTOR

Frank R. Williams, Utica, and William Abraham, New Hartford, both of N.Y., assignors to Consolidated Medical Equipment Inc., Utica, N.Y.

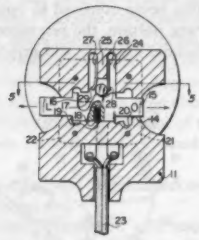
Filed Dec. 16, 1977, Ser. No. 861,282

Int. Cl.[2] H01R *7/06, 13/54*

U.S. Cl. 339—75 R **4 Claims**

1. In combination, an electrode including a stud having an enlarged head thereon, an electrical connector comprising a base plate, a slot in said base plate, a slidable locking element disposed in said slot, a cam surface disposed on said locking element, a recess in said base extending normally with respect to said slot, a pair of electrical contact elements, one of said electrical contact elements being fixed to said base plate on each side of said recess in said base plate whereby edge surfaces of said contact elements are in spaced relation to receive the electrode stud therebetween, an enlarged spacing portion between the contact elements to receive the head of the stud and adjacent thereto a reduced spacing portion between the contact elements of insufficient width to pass the head of the stud therebetween whereby when the electrode and connector

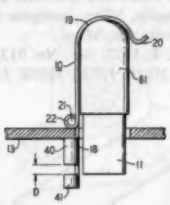
are to be attached the headed stud is placed within the recess within the enlarged spacing portion between the contact element and the locking element is moved to bring the cam surface into engagement with the headed stud to force the headed stud to a position within the recess within the reduced spacing portion between the contact elements and to maintain the headed stud in a locked position therein.



4,165,142
CONNECTOR CLIP

Edwin W. Grabau, Point Pleasant, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 18, 1978, Ser. No. 906,934
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 R **4 Claims**



1. A clip for securing in mated relationship a two-part connector having a first part mounted to a panel and a second part adapted for mating with said first part, characterized in that said clip comprises

a first section having a lateral surface and a curved upper section folding forward over said lateral surface and shaped generally to extend over a top surface of a mated connector, said first section having a pair of fingers extending from a lower end of said lateral surface and separated by a first space, said fingers each rolled back over said lateral surface in a direction opposite the direction of said curved upper section, each said rolled finger forming an enclosed tubular passage,

a second section having a lateral surface and a pair of tabs extending outward from each side of said lateral surface, said tabs curved back toward said lateral surface, said pair of tabs on each side of said lateral surface forming a first slot between them having a width adapted to accept said panel therebetween,

said second section having a finger extending from a top edge of said lateral surface and disposed evenly about the center thereof, said finger rolled back on the same side of said second section lateral surface as are said other tabs of said second section, said second section rolled finger forming an enclosed tubular passage having a width adapted to fit within said first space between said first section enclosed tubular passages,

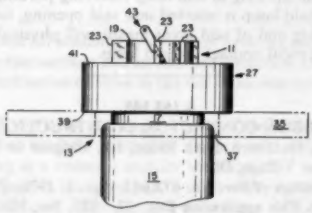
a pin extending through said first section enclosed tubular passages and said second section enclosed tubular passage thereby joining said first and second sections in hinged relationship with each other,

said pair of tabs of each side of said second section having an upper and a lower surface, said lower surface of the top tab on each side of said second section defining the top edge of said second section slot and said upper surface of the bottom tab on each side of said second section defining the lower edge of said second section slot, said lower edges of said upper tabs and said upper edges of said lower tabs forming bearing surfaces for supporting said retaining clip with respect to a panel inserted within said first slot.

4,165,143
ELECTRON TUBE SOCKET SECURING MEANS

Peter G. Puhak, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 3, 1978, Ser. No. 930,766
Int. Cl.[2] H01J *5/60*; H01R *13/54, 33/82*
U.S. Cl. 339—75 T **10 Claims**

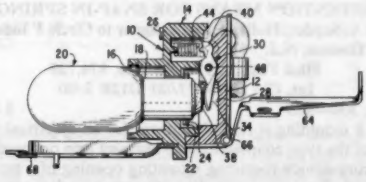


1. Means for releasably securing a socket member to the finned base of an electron tube, said socket having opposed surfaces and an opening formed therethrough dimensioned and configured to accommodate said base in an encompassing manner, said base being seated relative to one of said surfaces and having the terminal portion of at least one base fin egressing from an opposite surface of said socket, the improvement comprising: a bore formed in a slanted manner through the egressing portion of said base fin; and a substantially longitudinal locking pin having a length greater than that of said bore and formed of an integrated handle and shank, said shank having a proximal terminal portion and said handle an opposed distal terminal portion, said pin being slidingly accommodated within said bore in a manner that the end surface of said proximal portion substantially abuts a surface of said socket, said pin having retention means associated with the proximal portion of said shank and formed to interact with the egressing portion of said fin to constrain the removal of said pin from said bore thereby releasably securing said base to said socket.

4,165,144
LIGHT SOCKET WITH LEVER CONTACTS

Albert N. Cook, Madison; Boleslaw Kornatowski, Elizabeth, and Raymond S. Tyburcy, Middletown, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 24, 1978, Ser. No. 880,690
Int. Cl.[2] H01R *13/54, 17/22*
U.S. Cl. 339—88 R **1 Claim**



1. A light socket for bayonet-type lamps comprising:

a lamp receiving portion having an opening therethrough for receiving said lamp;

means for lockably retaining said lamp in said opening;

a base mountable to said lamp receiving portion for closing one end of said opening, said base having a recess formed therein, and said base formed with at least one hollow boss arranged alongside of said lamp receiving portion when said base is mounted to said lamp receiving portion, with said recess in registry with said opening;

lever means formed of an electrically conductive material having one end thereof extending into said base recess to engage an electrical contact on said lamp and an opposite end extending into said hollow boss, fulcrum means for said lever carried in said second housing between said recess and said hollow boss;

connecting means for providing electrical power to said lever means; and

compression spring means constrained in said hollow boss for engagement with the opposite end of said lever means for urging said contact engaging end of said lever means into said opening in said lamp receiving portion whereby, when said lamp is inserted into said opening, said contact engaging end of said lever means will physically engage an electrical contact on said lamp.

4,165,145

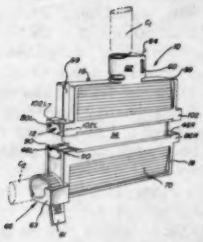
RIBBON CONNECTOR CONSTRUCTIONS

Thomas M. Steinbach, Park Ridge, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 672,643, Apr. 1, 1976, Pat. No. 4,089,579. This application Dec. 27, 1977, Ser. No. 864,439

Int. Cl.[2] H01R *13/54, 13/58*

U.S. Cl. 339—91 R **17 Claims**



1. A hood construction for an electrical connector having projecting portions on opposed end portions; said hood comprising a body portion; first engagement portions at one end portion of said hood defining a slot with adjacent hood portions for snugly receiving the projecting portions of one end portion of such connector; portions of said hood at the other end portion thereof being readily flexible relative to said body; second engagement portions on said flexible portions for snap engagement with the projecting portions at the other end portion of such a connector having one end portion engaged in said slot whereby said hood is retained on such a connector.

4,165,146

RETENTION MEANS FOR SNAP-IN SPRING

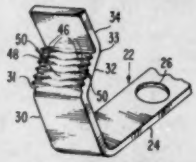
Charles A. Snyder, Holland, Pa., assignor to Circle F Industries, Inc., Trenton, N.J.

Filed Feb. 3, 1978, Ser. No. 874,738

Int. Cl.[2] H01R *13/00;* G12B *9/00*

U.S. Cl. 339—128 **3 Claims**

1. In a mounting spring clip means for an electrical wiring device of the type adapted to snap into and grip opposed edges of a wiring-device-receiving mounting opening of a mounting plate, said clip means including divergent spring arms resiliently, yieldably opposing movement toward each other, convergent gripping portions on the divergent ends of the spring arms, and transversely extending gripping means on said convergent portions, said spring arms being in embracing relation to the wiring device to be mounted, the improvement comprising serrations defining said gripping means, the serrations of each gripping portion being confined to opposed longitudinal edges of said gripping portion, the serrations extending along the opposite longitudinal edges of said gripping portion being



arranged in rows, the serrations of each row extending transversely of the length of the row, each serration of a row having its length aligned with a corresponding serration of the other row, said gripping portion having a shallowly dished, inwardly offset midwidth area intervening between the rows of serrations, the serrations of each row merging smoothly into and disappearing within said depressed area at the edge of said depressed area.

4,165,147

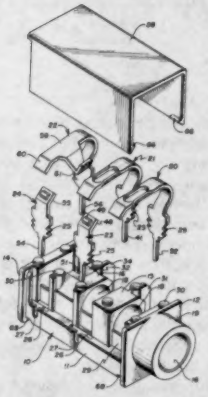
PRINTED CIRCUIT BOARD JACK

Josef J. Buck, Minneapolis, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Jun. 5, 1978, Ser. No. 912,196

Int. Cl.[2] H01R *17/18;* H05K *1/10*

U.S. Cl. 339—182 R **12 Claims**



1. An electrical jack suitable for direct connection to a printed circuit board comprising:

an elongated nonconductive housing having a generally cylindrical opening therein along a longitudinal axis for insertion of a plug member;

at least two contact assemblies mounted in said housing extending generally transverse to said cylindrical opening, each of said contact assemblies including

a first contact element mounted in a cantilevered manner in said housing and having a portion extending transversely across said cylindrical opening for electrical engagement with a portion of said plug member when inserted therein, said first contact element further including a free end movable between a first and second

position in response to insertion and removal of said plug member, respectively,

a second contact element mounted in a cantilevered manner in said housing and having a free end, each of the free ends of said first and second contact elements including contact surfaces for electrical engagement with each other when the free end of said first contact element is in its second position, the contact surface of said second contact element being disposed at an angle of at least about 10°–15° but less than about 75°–80° relative to the generally linear movement of the free end of said first contact element between said first and second positions,

means for retaining said first and second contact elements in said housing, and

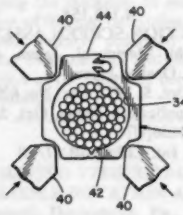
means electrically connected with each of said first and second contact elements for direct electrical connection with a printed circuit board.

4,165,148

COMPRESSIBLE ELECTRICAL CONNECTOR WITH POSITIVE MECHANICAL LOCK

Paul K. Campbell, and Edward L. Nichols, III, both of Birmingham, Ala., assignors to Square D Company, Park Ridge, Ill.

Filed Jul. 19, 1978, Ser. No. 925,737
Int. Cl.[2] H01R 5/08
U.S. Cl. 339—276 R **8 Claims**



1. A ductile metallic electrical and mechanical connector for attachment to one or more electrical cables and formable by a compressible process, said connector comprising:

at least one bifurcated body member having first and second leg portions initially connected by a reduced cross-sectional thickness portion of said body member to provide a plastically flowable hinge connection, said first and second leg portions defining an initial predetermined angle such that said body member can laterally engage an uninsulated section of an electrical cable;

said first leg having on the end opposite said reduced thickness portion an axially extending rib member and axially extending inner and outer ridges disposed on either side of said rib member;

said second leg having on the end opposite said reduced thickness portion axially extending inner and outer fingers, said rib member, said inner and outer ridges and said inner and outer fingers being oriented such that said outer finger lies between said outer ridge and said rib member, and said inner finger lies between said inner ridge and said rib member, when said body member is closed about an uninsulated section of an electrical cable, said enclosure occuring by pivoting of said leg members about said reduced thickness portion in response to hand applied external pressure; and

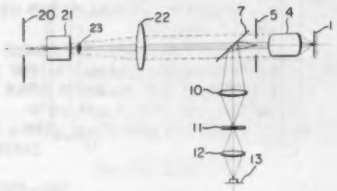
wherein said inner and outer fingers and said rib member are deformed to form a positive mechanical lock when an external crimping force is applied radially to said body member.

4,165,149

DEVICE FOR SCANNING AN OBJECT WITH A LIGHT BEAM

Akiyoshi Suzki, Tokyo, and Yoichi Hirabayashi, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1978, Ser. No. 870,081
Claims priority, application Japan, Jan. 21, 1977, 52/5503
Int. Cl.[2] G02B 27/17, 11/27
U.S. Cl. 350—6.1 **3 Claims**



1. A device for scanning with a light beam an object having a flat reflection surface and an inclined reflection surface with a certain inclination relative to the flat reflection surface, comprising:

(a) a deflector with the original point of deflection arranged to deflect the light beam from a light source, said deflector rotating at a constant angular velocity;

(b) an objective lens arranged to receive the light beam from said deflector, said objective lens being so disposed that said original point of deflection is positioned on the center of the focal plane of said objective;

(c) a light detector for detecting light which has been reflected at said object, and passed through said objective lens;

(d) a filter interposed between said objective lens and said light detector, said filter functioning to intercept light from said flat reflection surface, and to cause light from said inclined reflection surface to pass therethrough; and

(e) an optical element disposed between said deflector and said object, for converting the movement of the deflected light beam into a movement at a constant speed, over an area of the object to be scanned, which is proportional to said constant angular velocity.

4,165,150

LOW LOSS DIRECTIONAL COUPLING FOR OPTICAL FIBRES

Gary S. Duck, Ottawa, and Frederick D. King, Smith Falls, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 10, 1978, Ser. No. 895,001
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.15 **10 Claims**

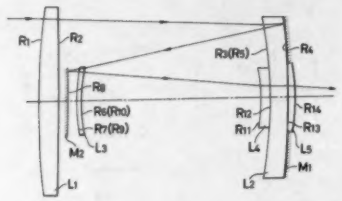
1. A low loss directional coupling for optical fibres comprising a first fibre and a second fibre, the second fibre wrapped round the first fibre a predetermined number of turns, any cladding layer on the fibres removed whereby the light transmitting cores of the fibres are in contact.

4,165,151

TWO-REFLECTING CATADIOPTRIC OPTICAL SYSTEM

Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1977, Ser. No. 806,507
Claims priority, application Japan, Jun. 19, 1976, 51/71696
Int. Cl.[2] G02B *17/00*
U.S. Cl. 350—201 3 Claims



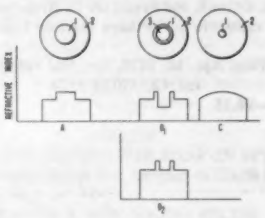
1. A two-reflecting catadioptric optical system including:
a front positive lens having a front surface whose radius of curvature is smaller than that of a rea surface thereof;
a negative meniscus lens positioned on the image side of said front positive lens in coaxial relation thereto, having a front surface concave toward the front and having a rear surface provided with a mirrored portion surrounding a light-permeable region;
a positive meniscus lens of forward convexity positioned between said front positive lens and said negative meniscus lens;
a convex mirror of rearward convexity positioned between said front positive lens and said positive meniscus lens, apart from said positive meniscus lens; and
a negative lens cemented onto the front surface of said negative meniscus lens and a positive lens cemented onto the rear surface of said negative meniscus lens in the light-permeable region.

4,165,152

PROCESS FOR PRODUCING OPTICAL TRANSMISSION FIBER

Satoshi Shiraishi; Kunio Fujiwara, and Shiro Kurosaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 648,998, Jan. 14, 1976, Pat. No. 4,082,420, which is a continuation of Ser. No. 419,011, Nov. 26, 1978, abandoned. This application Aug. 22, 1977, Ser. No. 826,572
Claims priority, application Japan, Nov. 25, 1972, 47-118345; Nov. 25, 1972, 47-118346
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.30 9 Claims



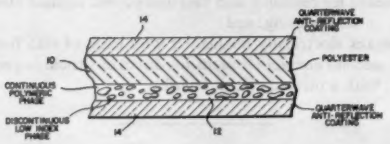
1. A tubular optical transmission fiber wherein the refractive index varies between the periphery and the central longitudinal axis of the fiber, said variation being symmetrical with respect to the central longitudinal axis of said fiber, said fiber comprising an inner cavity, an outer radial portion being a lower refractive index portion being made of dope fused silica containing B_2O_3, said doped fused silica consisting essentially of SiO_2 and B_2O_3 and an inner radial portion being a higher refractive index portion being made mainly of pure fused silica consisting essentially of SiO_2.

4,165,153

TRANSLUCENT SCREEN

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 25, 1978, Ser. No. 899,792
Int. Cl.[2] G03B *21/60*
U.S. Cl. 350—126 15 Claims



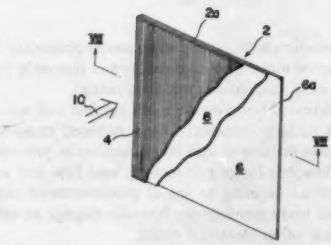
1. A translucent screen comprising a dispersion of particles as a discontinuous phase in a polymeric continuous phase, said continuous phase having a higher index of refraction than said particles, said particles and said continuous phase having indices of refraction differing by at least 0.10, said particles having nonplanar surfaces and having overall diameters not exceeding about 5 microns.

4,165,154

PROJECTION SCREEN ASSEMBLY

Yoshimasa Takahashi, Moriguchi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 5, 1977, Ser. No. 839,597
Claims priority, application Japan, Oct. 5, 1976, 51-120504; Mar. 15, 1977, 52-33138[U]
Int. Cl.[2] G03B *21/60*
U.S. Cl. 350—128 8 Claims



1. A screen assembly for projecting thereon light beam emitted from a source of light carrying an image, so as to form the image thereof, which comprises:
a transparent plate having on one side thereof a lenticulated surface means comprising a plurality of elongated cylindrical lens elements extending in a parallel relation to each other and on the other side thereof a mat-finished surface means, wherein said lenticulated surface means diffuses the incoming light in a horizontal direction which is perpendicular to the elongated cylindrical lens elements, and said mat-finished surface means diffuses the incoming light in all directions, relative to the direction of travel of the incoming light, whereby the light projected on the screen assembly diffuses at a first predetermined angle of diffusion which is small relative to the direction of the longitudinal axis of any one of said elongated cylindrical lens elements and at a second predetermined angle of diffusion which is great relative to the direction perpendicular to

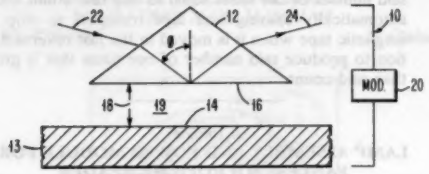
the longitudinal axis of any one of said elongated cylindrical lens elements.

4,165,155

AMPLITUDE MODULATION OF LIGHT BEAM

Joseph G. Gordon, II, and Glenn T. Sincerbox, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,171
Int. Cl.[2] G05D *25/00*
U.S. Cl. 350—285 11 Claims



1. An optical device comprising:

an optically transparent first material having a first plane surface,

a second material having a second plane surface with a negative dielectric constant facing said first surface to form a gap therebetween,

a medium filling said gap and having a dielectric constant whose magnitude is less than that of said first material, and

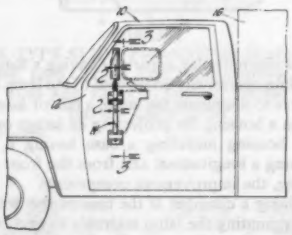
means for changing the thickness of said gap wherein the optical thickness of the gap determines the reflectivity of a monochromatic linearly polarized light beam that is passed into said first material and that undergoes total internal reflection at the interface between said first surface and said medium.

4,165,156

OUTSIDE MOUNTED VEHICLE MIRROR WITH MULTIPLE ROTATION AXES

Lawrence E. O'Connell, Doylestown, Pa., assignor to Delbar Products, Inc., Perkasie, Pa.

Filed Jul. 3, 1978, Ser. No. 921,378
Int. Cl.[2] G02B *5/08;* A47G *1/24*
U.S. Cl. 350—307 17 Claims



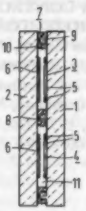
1. A mirror assembly for mounting on an outside vehicle panel, said assembly including an integral bracket member having a laterally extending leg portion with an inner end disposed proximate said vehicle panel and a downwardly and inwardly inclined leg portion having an inner end disposed proximate said vehicle panel, a linear support arm having a first end supported proximate the laterally outer portion of said bracket member for rotation about a substantially vertical axis, said support arm including a second end upwardly inclined at an acute angle to the laterally extending leg portion of said bracket member, and a mirror head having a transverse mid-plane, said mirror head including a support shaft having an axis generally parallel to and laterally offset from said transverse mid-plane, said support shaft including an end projecting exteriorly of said mirror head and supported upon said other end of said support arm to permit rotation of the mirror head about the axis of said support shaft, first and second bracket means respectively pivotally connecting the inner ends of the bracket member to said vehicle panel whereby the bracket member may be positioned between a fully extended laterally outward position and a folded-back storage position generally parallel to the vehicle panel.

4,165,157

LIQUID CRYSTAL CELL HAVING A GLASS FIBER FRAME

Manfred Kobale, Faistenhaar, and Hans Krüeger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 5, 1977, Ser. No. 822,205
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635942
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—343 1 Claim



1. A method of producing a liquid crystal cell comprising at least two plate members each having a surface with at least a portion thereof having electrical conductive coatings thereon, said plate members being spaced apart by a spacing frame means for maintaining the surfaces of the plates parallel to one another with the frame means and the two plates forming a chamber for receiving a liquid crystal material, said method comprising providing at least one glass fiber, drawing each glass fiber through a solution of synthetic adhesive material to produce a fiber having a synthetic adhesive casing, preliminarily cross-linking said material of the synthetic adhesive casing, positioning the glass fiber in the desired pattern of the spacing frame means on a surface of one of said plate members, preheating said one plate member to cause an attachment of the fiber to the surface thereof, assemblying the second plate member on the spacing frame means formed by the glass fiber, and then securing the plate members together and to the glass fiber of the frame means by applying temperature and pressure so that the synthetic adhesive casing extrudes between the surfaces of the plate member and the fibers to enable each of said surfaces of the plate members to come in contact with the fiber and said synthetic material to adhesively connect said surfaces to said fiber.

4,165,158

CAST CONTACT LENSES AND METHOD FOR MAKING SAME

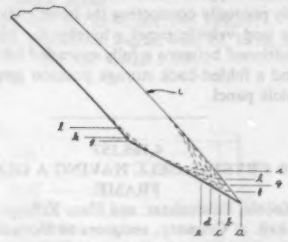
Edward A. Travnicek, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jul. 25, 1977, Ser. No. 818,491
Int. Cl.[2] G02C *7/04*
U.S. Cl. 351—160 H 6 Claims

1. A cast and otherwise unworked finished corneal contact lens comprising:

a meniscus body of ophthalmic lens material having a vanishing thin edge without flashing, the inflection point of said edge being along a single line located intermediately of adjacent portions of oppositely disposed convex exterior and concave interior surfaces of said body, said inflec-

tion point specifically being in such position as to lie between the eyelid and cornea of an eye receiving the lens



and out of engagement with either when the lens is worn and said lens requiring no further finishing.

4,165,159

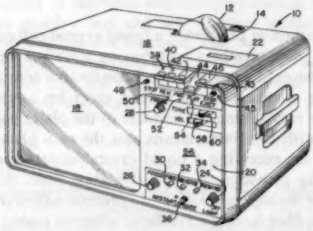
MICROPROCESSOR CONTROLLED FILMSTRIP PROJECTOR

John V. Landau, Mountain Lakes, N.J.; Marvin I. Mindell, Pittsford; William T. Daly, Rochester, both of N.Y.; J. David Garland, Passaic, N.J., and Arthur B. Price, Byron, N.Y., assignors to The Singer Company, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,889

Int. Cl.[2] G11B *31/00*; G09B *1/00*; G03B *21/00*

U.S. Cl. 353—15 **38 Claims**



1. Aparatus for regaining synchronization between a series of image presentations and an audio accompaniment therefor recorded on a magnetic tape and having associated cue tones recorded thereon comprising:

a projector for projecting a series of said images;

said projector including image bearing means and means for moving said image bearing means through said projector in a forward and reverse direction to change the projected image;

said projector including means for providing a pulse signal each time a projected image is changed by moving said image bearing means in a forward or reverse direction;

tape transport means for said magnetic tape and including means for separating said cue tones from said audio accompaniment as said tape is moved in a fast forward or a fast reverse direction; and

automatic processing means coupled between said projector and said tape transport means;

said processing means including means for receiving the pulse signals indicative of said image changes and the cue tones from said fast moving tape for algebraically keeping a first count therein that is indicative of the synchronization, or distance and direction to synchronization, between said projected images and the audio accompaniment on said magnetic tape;

said first count being indicative of the number of cue tones to be produced by moving said magnetic tape to regain synchronization between said projected images and said sound;

said tape transport including means to enable said magnetic tape to be moved in a fast forward direction to produce a number of cue tones equal to said first count to regain synchronization between said images and said sound;

said tape transport and said processing means including means to enable said magnetic tape to be moved in a fast reverse direction to automatically produce a number of cue tones that is greater than said first count by a predetermined amount to regain synchronization between said images and said sound;

said processing means including means for automatically causing said tape transport to stop said magnetic tape when it is moved in the fast forward direction to produce said number of cue tones equal to said first count and for automatically causing said tape transport to stop said magnetic tape when it is moved in the fast reverse direction to produce said number of cue tones that is greater than said count.

4,165,160

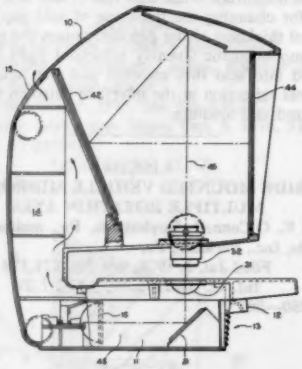
LAMP ASSEMBLY AND POWER MODULE FOR FANLESS MICROFICHE READER

Thomas J. Persha; Eino M. Lehto, both of Juneau; Richard Dueck, Hartford, and Nick Hechimovich, Horicon, all of Wis., assignors to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 851,833, Nov. 16, 1977. This application May 15, 1978, Ser. No. 905,816

Int. Cl.[2] G03B *21/16, 21/28*

U.S. Cl. 353—55 **5 Claims**



1. In a microform display apparatus having a lamp assembly, a power module operatively connected to the lamp assembly to provide power to illuminate the lamp, a mirror assembly and a lens system in a housing for projecting an image on a viewing surface, the housing including a base having a center line extending along a longitudinal axis from the front to the back of the housing, the improvement comprising:

means defining a chamber at the base of the housing;

means for mounting the lamp assembly in said chamber at a point remote from the center line for projecting a beam of light at a predetermined acute angle with respect to the longitudinal axis toward the mirror assembly;

means for mounting the power module in said chamber on the other side of the longitudinal axis from said lamp assembly;

means for mounting the mirror assembly in said chamber so as to reflect light from the lamp assembly to the lens system;

means defining an air inlet at one end of said chamber;

a substantially vertically rising chimney in said housing and communicating with the end of said chamber opposite said air inlet and substantially over the lamp assembly and power module;

and dichroic reflector means disposed in said chamber so as

to selectively direct visible light from the lamp assembly to the mirror assembly and allow infra red radiation to pass in a direction toward the chimney,

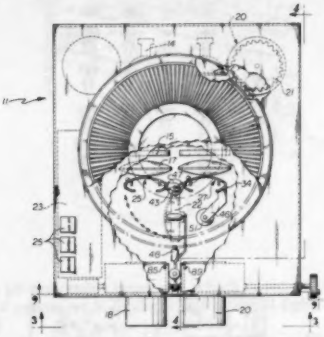
whereby cooling air flows from said air inlet, passes over the lamp assembly and the power module where heat is transferred to the cooling air, and then rises in said chimney where it escapes from the housing.

4,165,161

MULTIPLE OPTICS SLIDE PROJECTOR

Gideon A. Kramer, 2401 SW. 172nd, Seattle, Wash. 98166

Filed Apr. 24, 1978, Ser. No. 899,082
Int. Cl.[2] G03B *21/20, 21/26, 1/48*
U.S. Cl. 353—86 **27 Claims**



1. In a multiple optics projection slide projector, an apparatus for moving slides stored in a slide receptacle into and out of either of at least two projection optics systems, comprising:

first and second slide gate means for holding slides, each slide gate means being movable between a first position in which slides are acquired and released, and a second position in which acquired slides are projected onto a screen or the like; and

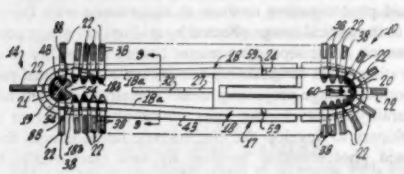
first and second means for rotating, respectively, said first and second slide gate means between said first and second positions about axes which are parallel to the plane of the slides in said second position.

4,165,162

TRACK-TYPE SLIDE PROJECTOR MAGAZINE

Gerald J. Frey, 1486 Cantera Ave., Santa Barbara, Calif. 93110

Filed Aug. 22, 1977, Ser. No. 826,551
Int. Cl.[2] G03B *23/08*
U.S. Cl. 353—109 **37 Claims**



1. A magazine for use in a slide projector, comprising:

an elongated plastic body having two elongated sidewalls disposed in substantially parallel first and second planes, and two arcuate endwalls connecting said sidewalls at the ends of said body and cooperating therewith to form a continuous rail having oppositely facing top and bottom edges disposed in parallel third and fourth planes;

a rib extending around the outer side of said body and having a top side in an intermediate fifth plane parallel to said third and fourth planes;

said body being divided along said sidewalls into first and second relatively movable end sections for longitudinal expansion and contraction, said second end section being movably mounted on said first end section;

spring means yieldably urging said second end section toward said first end section;

a drive shaft rotatably mounted on said body inside the arcuate endwall of said first end section, said drive shaft having an outer surface coaxial with said arcuate surface of said first end section, and formed with four equally spaced longitudinal driving grooves of V-shaped cross-section therein;

a series of plastic slide holders mounted and stored on said rail in closely stacked, side-by-side relation to be advanced step by step thereon by said drive shaft, each of said holders having a base positioned along the outer side of said rail and slidably mounted thereon, and slide-holding means carried by said base to hold a slide in an outwardly projecting position for movement around said rail;

said bases having inner side portions formed with inwardly opening, dove-tail-like notches fitted over said rail, and the open inner sides of said notches being defined between upper and lower fingers projecting toward each other along the inner side of said rail and having outwardly facing edges sliding along the inner side of the rail;

said notches having top edge walls slidably engaging the top edge of the rail to ride thereon as the holders slide around the rail, and each notch having an abutment edge along its closed outer side slidable along the top side of said rib to resist tilting of the slide holder on the rail;

drive couplings of V-shaped cross-section on the inner sides of said fingers facing inwardly for engagement with said driving grooves in said drive shaft;

said slide holders filling said sidewalls and said second end section when said end sections are separated by a small gap, whereby said spring means urge the holders toward said drive shaft;

the sidewalls of said rail having diverging sections adjacent said shaft for tilting said holders to position said fingers for positive engagement in said grooves;

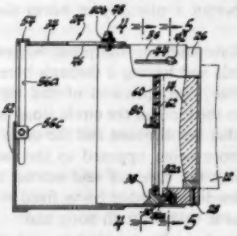
and spanning means on said body extending across said gap to maintain said slide holders in alignment with said rail during movement of the slide holders across said gap.

4,165,163

CAMERA HAVING MULTIPLE IMAGE DEVICE

Savarian F. Lemanski, 109 Taylor Ave., Detroit, Mich. 48202

Filed Nov. 25, 1977, Ser. No. 854,627
Int. Cl.[2] G03B *1/00*
U.S. Cl. 354—122 **5 Claims**



1. In combination with a camera having a lens for transmitting light to expose film in the camera, a multiple image attachment comprising:

a housing comprising a first tube and a second tube telescopically received in the first tube for longitudinal motion thereto, said housing having a first opening and a second opening for the transmission of light through said housing;

means for mounting said housing on the camera in a first position such that said first opening is adjacent the camera lens;

first mask means mounted in the first tube an adjusted distance with respect to the lens for partially blocking light being received into the housing;

second mask means mounted in the second tube in a position between the first mask means and the camera lens, the second mask means being cooperable with the first mask means to permit light to be transmitted through only a predetermined portion of the lens;

the distance between the first mask means and the second mask means being adjustable by adjusting the position of the first tube with respect to the second tube; and

said mounting means supporting said first mask means and said second mask means for motion toward a second position to permit light to be transmitted to a portion of the lens through which light was blocked in said first mask position.

4,165,164

DIAL CLICK STOP APPARATUS

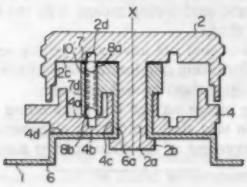
Shigeo Akasaka, Kodaira, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 18, 1978, Ser. No. 907,307

Claims priority, application Japan, May 24, 1977, 52-66577[U]

Int. Cl.[2] G03B *17/00*; G01D *13/00*

U.S. Cl. 354—289 **4 Claims**



1. A dial click stop apparatus comprising:

a first dial rotatably supported on a body and having on one surface thereof a plurality of bores distributed along a circle;

a second dial rotatable about the same rotation axis as that of said first dial but independently of it and having on one surface thereof a plurality of bores distributed along a circle;

an intermediate member interposed between said first and second dials and having a through bore passing through said member, one open end of said through bore being opposed to the locus of the circle along which the bores of said first dial are disposed and the other open end of said through bore being opposed to the locus of the circle along which the bores of said second dial are disposed, said intermediate member being fixed to said body;

detent means in said through bore; and

a biasing member also inserted in said through bore and adapted to bias one of said detent means against said first dial while biasing the other against second dial, whereby said first dial may be click stopped through engagement of one of said detent means with any one of the bores of said first dial and said second dial may be click stopped through engagement of the other of said detent means with any one of the bores of said second dial.

4,165,165

COLOR IMAGE FORMATION APPARATUS

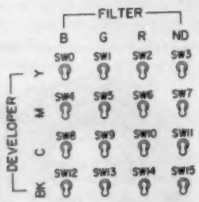
Naoki Iwami, Tokyo; Hidejiro Kadowaki, Yokohama; Takao Aoki, Abiko; Shunichi Kubo, Tokyo; Akihiro Tomosada, Yokohama; Tetsuji Tachika, Tokyo, and Eiichi Kondo, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

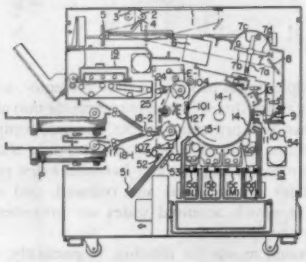
Filed Feb. 8, 1977, Ser. No. 766,681

Claims priority, application Japan, Feb. 12, 1976, 51/14274

Int. Cl.[2] G03G *15/01*

U.S. Cl. 355—4 **21 Claims**





1. A color image forming apparatus which projects an optical image, having light components of an image original, upon a photosensitive medium for forming electrostatic latent images thereon, and which color-develops the latent images to form a color image, said apparatus comprising a photosensitive medium, optical image projecting means for exposing said photosensitive medium to the optical image, electrostatic latent image formation means for forming electrostatic latent images on said photosensitive medium in accordance with the exposure to the optical image effected by said optical image projecting means, color separating means having a plurality of color separating filters for selective disposition in the optical path of said optical image projecting means, developing means having a plurality of developing units for supplying different color developers to develop the electrostatic latent images formed on said photosensitive medium by said electrostatic latent image formation means, a plurality of process mode setting means each having a first element for setting a selected one of said color separating filters across the optical path, and a second element for setting a corresponding selected one of said developing units to be operated, wherein two of said process mode setting means may be identically set and control means coupled with each of said process mode setting means, for actuating said separating filters and said developing means in a predetermined order and in accordance with the settings of said first and second elements.

4,165,166
EXPOSURE CONTROLS FOR PHOTOGRAPHIC APPARATUS

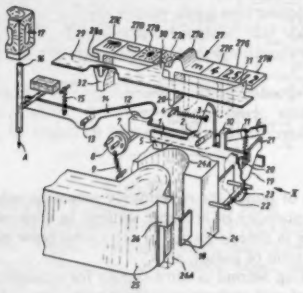
Dieter Engelsmann, Unterhaching; Hubert Hackenberg, Munich, and Rolf Schröder, Baldham, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,339

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717736

Int. Cl.[2] G03B *7/00, 15/03, 17/00*

U.S. Cl. 354—21 **13 Claims**



1. In a photographic apparatus which is convertible for the making of exposures in daylight and artificial light, the combination of

(1) a housing having a chamber for containers provided with markers denoting the sensitivity of film therein;

(2) a follower movably mounted in said housing and being displaceable by the marker of the inserted container to an extent which is a function of the sensitivity of film in such container;

(3) selector means mounted in said housing and movable between a plurality of positions each of which denotes a different intensity of scene light;

(4) control means movably mounted in said housing in the path of movement of said follower and also in the path of movement of said selector means so that the position of said control means is a function of the position of said selector means as well as a function of the sensitivity of film in the inserted container; and

(5) exposure time selecting means including adjusting means movable between a plurality of positions each of which corresponds to a different exposure time, said adjusting means being located in the path of movement of said control means so that said control means can change the position of said adjusting means and hence the exposure time as a function of the sensitivity of film in the inserted container and/or as a function of the position of said selector means, and means for moving said adjusting means in response to conversion of said apparatus from the making of exposures in one type of light to the making of exposures in the other type of light.

4,165,167
PHOTOGRAPHIC CAMERA

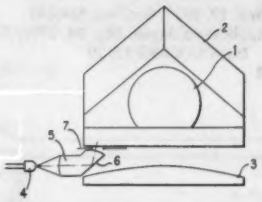
Rolf Jurenz, and Claus Becker, both of Dresden, Fed. Rep. of Germany, assignors to Veb Pentacon Dresden Kamera-Undkinowerke, Dresden, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,899

Int. Cl.[2] G03B *17/20, 19/12*

U.S. Cl. 354—53 **5 Claims**

1. In a camera having a viewfinder and exposure factor indicator system and including a roof prism, a field lens, an eyepiece, an indicator panel carrying exposure factor markings, and a luminous element which illuminates the indicator panel uniformly, the provision of an image reproduction system adjacent the indicator panel, the indicator panel being located between said system and the roof prism, which system transmits therethrough the light ray from the luminous element to the roof prism so as to reproduce the exposure factor markings and an image of the luminous element visible to the observer of the viewfinder, said reproduction system having a reflecting surface arranged to reflect the light from the luminous element into the roof prism.



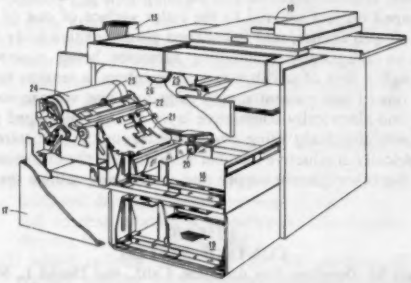
4,165,168
ELECTROPHOTOGRAPHIC DOCUMENT COPIER MACHINE WITH MODULAR PAPER PATH ASSEMBLY

Gerald W. Baumann; Robert L. Burdick, both of Boulder, Colo.; Willie Goff, Jr., Austin, Tex., and Edwin L. Libby, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,058

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **2 Claims**



1. In an electrophotographic machine of the transfer type including a photoconductor material upon which images of documents to be copied are reproduced, a modular construction wherein a slide-out main drawer is provided upon which is mounted the copy paper path mechanisms, said main drawer including:

at least one copy paper storage bin for holding a supply of copy paper;

copy paper feed means for moving said paper out of said bins;

transport means for receiving said paper from said feed means and moving said copy paper to a transfer station whereat said paper receives the image on said photoconductor;

a transfer corona;

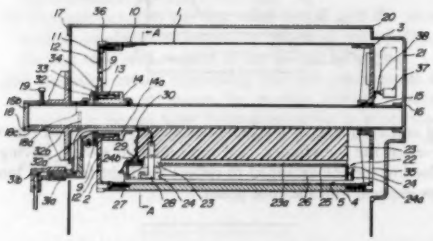
fuser means for impressing said image on said copy paper, and

wherein said storage bin is mounted in a mini-drawer separate from but within said main drawer whereby said storage bin is made accessible without opening said main drawer.

4,165,169
PHOTOSENSITIVE DRUM FOR ELECTROGRAPHIC APPARATUS

Kiyoshi Miyashita, and Katsuhiko Kimura, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Sep. 19, 1977, Ser. No. 834,849
Claims priority, application Japan, Sep. 24, 1976, 51-13760
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DR **3 Claims**



1. An improved electrographic apparatus comprising a photosensitive drum formed of a foil-shaped photosensitive body wound around a disc-shaped frame, a corona discharge device arranged in the photosensitive drum and emitting a flow of corona ions toward the photosensitive drum, means for detachably mounting the photosensitive drum on an electrographic apparatus body, the photosensitive drum being inserted into and removed from the electrographic apparatus body, said improvement comprises: first and a second bar-shaped members secured to opposed peripheral edges of said foil-shaped photosensitive drum and engaged with said disc-shaped frames, respectively, and current supply rings concentrically arranged on and secured to the outer surface of one of said disc-shaped frames, said foil-shaped photosensitive body having an electrically conductive substrate being connected through a first of said bar-shaped members, a tension spring and one of said current supply rings to a bias voltage source and said electrically conductive layer of said foil-shaped photoconductive body being connected through a lead wire, an electrically conductive member embedded in the disc member and the other current supply ring to said bias voltage source.

4,165,170
CONTROL SYSTEM

James M. Donohue, Los Alamitos, Calif., and Daniel L. Mueller, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

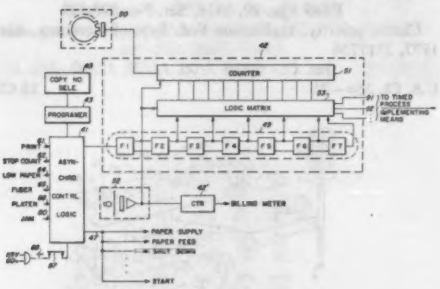
Division of Ser. No. 438,972, Feb. 4, 1974, Pat. No. 3,917,396, which is a continuation-in-part of Ser. No. 244,734, Apr. 12, 1972, Pat. No. 3,796,486, which is a continuation of Ser. No. 97,745, Dec. 14, 1970, abandoned. This application Mar. 24, 1975, Ser. No. 561,467
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 **1 Claim**

1. A method of controlling an electrostatographic reproducing system for producing copies on copy sheets, a path for said copy sheets, an imaging path, a plurality of actuable stations positioned along said copy sheet and imaging paths for processing said copies including stations for forming and developing latent electrostatic images of an original in succession on a photoreceptor means driven along said imaging path, and transferring the developed images onto the copy sheets traversing along said copy sheet path in succession, wherein said system is designed to make copies at a given rate and wherein said imaging and copy sheet paths are divisible into zones so spaced that the images and copy sheets in transit traverse corresponding zones at said given rate, said method including the steps of:

generating a first train of pulses, the repetition rate of which corresponds to the rate at which the copies are made,

generating a second train of pulses, the repetition rate of which is substantially higher than that of said first train of pulses,

deriving timed first control signals from said first and second



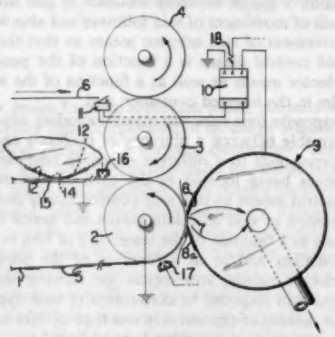
train of pulses for repetitively actuating selected ones of said plurality of actuable stations in various ones of said zones in time sequence in successive pulse periods of said first train of pulses, and

generating second control signals for actuating the remainder of said stations asynchronously for making copies in succession.

4,165,171
ELECTROGRAPHIC APPARATUS AND PROCESS

Conrardus J. G. Lemmen, Baexem, Netherlands, assignor to Océ-van der Grinten N.V., Venlo, Netherlands

Continuation-in-part of Ser. No. 564,413, Apr. 2, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 723,766
Claims priority, application Netherlands, Apr. 8, 1974, 7404767
Int. Cl.[2] G03G *21/00*; B08B *3/12*; G03G *15/00*
U.S. Cl. 355—15 **47 Claims**



22. In an electrographic apparatus whereby an electrostatic charge pattern on a photoconductive support surface is developed into a powder image thereon by powder particles attracted to image areas of the charge pattern and a background may result from powder particles adhering to non-image areas of said surface, means for removing powder particls from said surface, comprising an electrically conductive wall having a surface extending over and facing said support surface and disposed near thereto at a location in a path of movement of said support surface with powder particles thereon, means for generating between said wall surface and said support surface an electric field spanning substantially the width of the support surface and effective to attract powder particles therefrom toward said wall surface, a suction opening extending over said

support surface along said wall surface, and means for flowing air transversely through said field in a thin stream between said surfaces and then away from said support surface through said suction opening, whereby at least powder particles that lie loose on said support surface and any powder particles loosened from it by said field are removed and sucked away through said opening;

said wall being the peripheral wall of a tubular member disposed across said path and connected with means for sucking air through said member, said field generating means including means for applying to said wall a direct voltage having a polarity corresponding to that of said charge pattern, and said suction opening being a slot extending through and axially along said peripheral wall over the width of said support surface, said wall surface being surface portions of said peripheral wall bordering said slot;

said wall surface having thereon a semi-conductive coating preventing arcing between said surfaces, said coating having a resistance of between 10^5 and 10^{10} ohm cm.

4,165,172

DRUM CLEANING SYSTEM FOR ELECTROPHOTOGRAPHIC APPARATUS

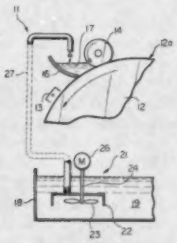
Toyoo Okamoto; Toshio Watanabe; Akira Midorikawa; Tatsuo Tani, and Seiichi Miyakawa, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,770

Claims priority, application Japan, Dec. 16, 1975, 50/150416

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **14 Claims**



12. In an electrophotographic process in which an electrostatic image formed on a movable photoconductive member is developed using a toner substance, the steps for removing residual toner substance from the photoconductive member after the electrostatic image is developed comprising:

(a) pressing a spongy cleaning member against the photoconductive member below and downstream of an uppermost portion of the photoconductive member in a direction of movement thereof;

(b) pressing a cleaning blade against the photoconductive member below and downstream of the spongy cleaning member in said direction of movement of the photoconductive member;

(c) moving the photoconductive member relative to the spongy cleaning member and cleaning blade in said direction of movement; and

(d) supplying a cleaning liquid to a trough defined by the photoconductive member, the spongy cleaning member and the cleaning blade while the photoconductive member is moving in a quantity sufficient to wash away substantially all residual toner substance from between the cleaning blade and the photoconductive member, the spongy cleaning member having and absorbent capacity for the cleaning liquid sufficient to prevent solidification of the toner substance between the spongy cleaning member and the photoconductive member after the completion of step (c).

4,165,173

TONER REMOVING MEANS FOR PHOTOSENSITIVE DRUMS FOR ELECTROPHOTOGRAPHY

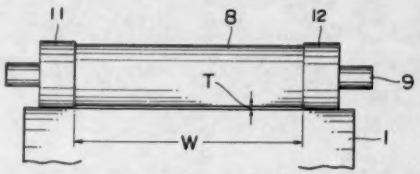
Fumio Iwai, Inagi; Junichi Koiso; Masakazu Kokiso, both of Hachioji, and Masaru Inoue, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1977, Ser. No. 837,160

Claims priority, application Japan, Oct. 4, 1976, 51-119054

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **3 Claims**



1. In electrophotography apparatus comprising a drum roll that is rotated in one direction about a fixed axis and has a cylindrical, photosensitive image area surface portion that may carry residual toner when its rotation brings it to one location around the drum roll, residual toner removing means of the type comprising a blade that contacts said surface portion at said location and a resilient transfer roll rotatable on a coaxial shaft that extends parallel to the axis of the drum roll, said transfer roll being disposed adjacent to the drum roll at a location below said blade and having a cylindrical surface portion which opposes said image area surface portion, and said transfer roll serving for transfer away from the drum roll of residual toner that is scraped off of said image area surface portion by the blade and falls therefrom, said residual toner removing means being characterized by:

A. each of said rolls having a coaxial end portion at each of its ends, axially outward of its said surface portion,

(1) said end portions on one roll being larger in diameter than the said cylindrical surface portion thereof, and

(2) said end portions on the other roll being at least as large in diameter as the said cylindrical surface portion thereof; and

B. means biasing said shaft laterally towards the axis of the drum roll with a force

(1) which maintains said end portions on each roll in frictional driving engagement with those on the other roll so that rotation is imparted to the transfer roll directly by the drum roll, and

(2) which radially compresses the end portions of the resilient transfer roll to maintain its shaft no closer to the drum roll axis than to permit merely line contact between said cylindrical surface portions, but no farther therefrom than to permit a space between those surface portions which is narrower than the diameter of toner particles.

4,165,174

RECORDING APPARATUS

Leonard E. Jenkins, Jr., Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 21, 1977, Ser. No. 844,353

Int. Cl.² B26D *5/20*; G03B *27/76, 29/00*

U.S. Cl. 355—29 **8 Claims**

1. In a recording instrument, a record medium driving and shearing means comprising:

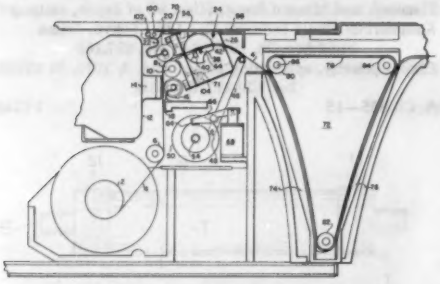
a cutter assembly including a fixed blade member and a rotary action blade member mounted eccentrically with respect to the rotary axis thereof,

an actuator arm connected to said rotary blade member,

selectively actuated drive means connected to said actuator arm for selectively actuating said rotary blade member,

said rotary blade member being positioned adjacent to said

fixed blade member for cooperative shearing association therewith whenever said rotary blade member is actuated by said actuator arm, and



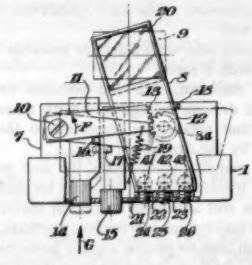
spring biased bearing means supporting the ends of said rotary blade member and urging said rotary blade member toward said fixed blade member.

4,165,175

APPARATUS FOR SAMPLING PRINTING LIGHT IN A PHOTOGRAPHIC ENLARGER FOR DETERMINING ITS COLOR COMPOSITION

Siegfried Barbieri, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate, Bozen, Italy

Filed Jun. 15, 1977, Ser. No. 806,625
Claims priority, application Italy, Jun. 25, 1976, 4836 A/76
Int. Cl.[2] G03B *27/78*
U.S. Cl. 355—38 **24 Claims**



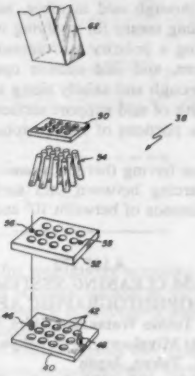
1. An apparatus for taking samples of the light projected in a photographic enlarger, having an image holder, an objective lens, a substantially planar space disposed therebetween and a color-determining device, and transmitting the samples to the color-determining device comprising an elongated sampling duct, movable support means mounting the sampling duct in the substantially planar space between the image holder and the objective lens, drive means for interposing the sampling duct in a position between the path of the printing light and the color-determining device for determining the color composition of the printing light and removing the sampling duct from the path of the printing light to obtain an exposure of the image in the photographic enlarger, and the sampling duct having a light entrance aperture disposed substantially parallel to the image holder when it is interposed between the path of the printing light and the color-determining device whereby the color content of the printing light is determined.

4,165,176

PHOTOGRAPHIC FILM MEASUREMENT WITH INTERCHANGEABLE LIGHT GUIDING MODULES

Ronald C. Laska, Minnetonka, and Wayne R. Pierce, Edina, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Mar. 30, 1978, Ser. No. 891,815
Int. Cl.[2] G03B *27/78*
U.S. Cl. 355—68 **9 Claims**



1. In a photographic printer, an improved film measurement system comprising:

an array of light sensors, the light sensors disposed in a fixed pattern;

a plurality of interchangeable first light-guiding modules for use with different size films, each module having a first surface which is proximate the film and a second surface which is proximate the array of light sensors when the module is in position, and each module having a plurality of light-conducting channels having their first ends exposed at the first surface in a light-receiving pattern which depends upon the particular module and film size and having their second ends exposed at the second surface in a light-transmitting pattern corresponding to the fixed pattern of the array of light sensors, whereby the light sensors of the array receive light from different portions of the film through the light-conducting channels.

4,165,177

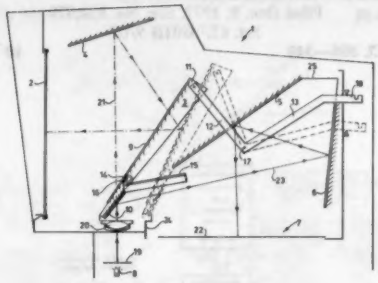
REAR PROJECTION MICROFILM READER/PRINTER

Paul M. James, 27, Portland Rd., London W.11., England

Continuation of Ser. No. 665,451, Mar. 10, 1976, abandoned.
This application Aug. 18, 1977, Ser. No. 825,835
Claims priority, application United Kingdom, Mar. 12, 1975, 10231/75
Int. Cl.[2] G03B *27/16*
U.S. Cl. 355—45 **3 Claims**

1. A microfilm reader/printer comprising a housing, a translucent viewing screen forming part of the housing, a printing station within the housing having a horizontal printing plane, a first fixed reflecting surface, a moving member having two reflecting surfaces on opposite sides of said member, said surfaces reflecting light in opposite directions away from the moving member, means for supporting the moving member in a printing position and in a reading position and for moving said member between the reading position and the printing position, a substantially light-tight compartment within the housing having an opening thereto confronting said screen, said moving member obstructing the direct passage of daylight from said viewing screen to said opening and said printing plane when said moving member is in any position, said printing plane being located in said light-tight compartment, second and third fixed reflecting surface within said compartment, a

light source, and a support for a microfilm input; whereby light from the light source is transmitted to said viewing screen via said first fixed reflecting surface and one of said reflecting surfaces of said moving member when the latter is in its reading position, and is transmitted to said printing plane via said second and third fixed reflecting surfaces in said compartment and



the other of said reflecting surfaces of said moving member when the latter is in its printing position, said means for supporting and moving said moving member comprising a pivot and a mechanism attached to said member by said pivot to effect a combined translation and rotation of the moving member as the said means is actuated.

4,165,178

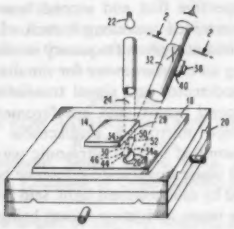
GAP MEASUREMENT TOOL

Salvatore R. Coumo, Jr., Wappingers Falls, and Thomas M. Ellington, Jr., Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,905

Int. Cl.[2] G01C *3/00*

U.S. Cl. 356—1 **10 Claims**



9. A method of measuring the gap between the bottom surface of a component and the top surface of a board or the like comprising the steps of:

generating a beam of collimated light vertical to the board so as produce a light spot on the board;

moving the components so as to intercept the beam of light or right angles thereby producing a component edge shadow in the light spot;

fixing a viewing device at a predetermined angle with respect to the vertical from said board and at a position to include the edge shadow in the light spot and the bottom edge of said component in the view;

fixing the reticle of the sighting device tangent to one of the edge shadow in the light spot or the bottom edge of the component;

moving the reticle of the sighting device horizontally from one of the edge shadow in the light spot or the bottom edge of the component to the other;

measuring the distance the reticle moves in going from one of the edge shadow in the light spot or the bottom edge of the component to the other;

this distance representing the opposite side of a right triangle with the gap between the component and the board being the adjacent side and the hypotenuse extending from the end of the opposite side to the end of the adjacent side along the fixed angle of the viewing device;

calculating the length of the adjacent side of the right triangle extending vertically from the top surface of the substrate to the bottom surface of the component from the fixed angle of the viewing device with the vertical from the substrate and the measured length of the opposite side.

4,165,179

DEVICE FOR WIPING OPTICAL WINDOW IN TURBIDIMETER OR SIMILAR OPTICAL INSTRUMENT FOR EXAMINING LIQUID SAMPLE

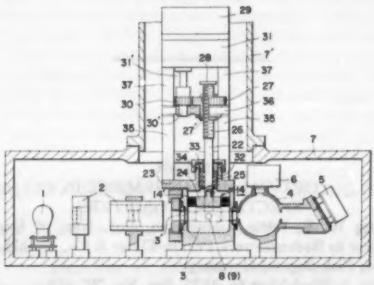
Ko Sato, Tokyo, Japan, assignor to Nippon Precision Optical Instrument Co., Ltd. and Nippon S R S, Inc., both of Tokyo, Japan

Filed Jul. 13, 1977, Ser. No. 815,088

Claims priority, application Japan, Aug. 19, 1976, 51-98159; Mar. 10, 1977, 52-25390

Int. Cl.[2] G01N *21/24*

U.S. Cl. 356—246 **2 Claims**



1. A device for wiping an optical window of a sample cell of an optical instrument for examining a liquid sample in the sample cell, which comprises a shaft having a leading end inserted in said sample cell, a wiper attached to the leading shaft end, a motor arranged to operate said shaft, and means effective upon operation of said motor for linearly and non-rotatively moving said shaft and wiper between a waiting position remote from said optical window and a wiping position opposite said window, and for rotating said shaft and wiper only in said wiping position.

4,165,180

AUTOMATIC COMPUTING COLOR METER

Michael Failes, Mississauga, Canada, assignor to Canadian Instrumentation and Research Limited, Mississauga, Canada

Filed Jun. 17, 1977, Ser. No. 807,435

Int. Cl.[2] G01J *3/42, 3/50*

U.S. Cl. 356—310 **21 Claims**

1. An apparatus for the measurement of colour of a sample which comprises:

(a) an illumination means for illumination of said sample with light, the sample reflecting a part of said light;

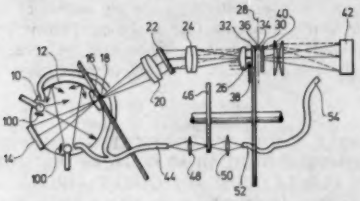
(b) an electro-optical sensing head to receive the reflected light from said illuminated sample and to output electronic signals, said electro-optical sensing head comprising:

(i) means for dispersing the reflected light from said sample to form a spectrum;

(ii) a moving spatial filter to modulate said spectrum in time and space;

(iii) a masking means to selectively mask the light from the modulated spectrum;

(iv) means for transmitting pulses of light from said illumination means to a photodetector via a reference optical path which is independent of the sample thereby producing reference light pulses; and



(v) a photodetector to detect the modulated spectrum and said reference light pulses and to transform said modulated spectrum and said reference light pulses into an electronic signal; and

(c) an electronic processing unit to process said electronic signals from said electro-optical sensing head.

4,165,181

OPTICAL ARRANGEMENT IN SPECTROPHOTOMETERS

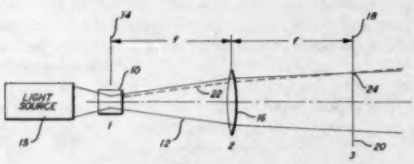
Wolfgang W. F. Witte, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,359

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623653

Int. Cl.[2] G01J 3/42

U.S. Cl. 356—319 **3 Claims**



1. A spectrophotometer comprising,

a cuvette,

a photoelectric detector having a photosensitive surface,

a light source arranged for passing a light beam through said cuvette onto said photosensitive surface,

an imaging optical system arranged between said cuvette and said photoelectric detector, said imaging optical system having a front principal focal plane and a rear principal focal plane having substantially equal focal lengths, said cuvette being located in the front focal plane and said photosensitive surface being located in the rear principal focal plane which is outside the image plane of said light source, so that deflection of a beam of light in the cuvette will not substantially change the location thereof on the photosensitive surface.

4,165,182

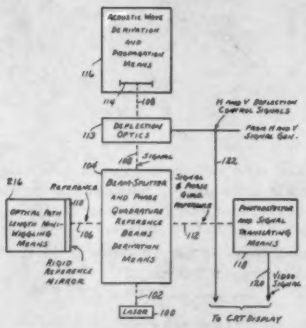
SYSTEM FOR OBTAINING DISPLACEMENT-AMPLITUDE INFORMATION FROM A QUADRATURE-DUAL INTERFEROMETER

David H. R. Vilkomerson, 2 Carter Brook La , R.D. 4, Princeton, N.J. 08540, assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Dec. 9, 1977, Ser. No. 859,079

Int. Cl.[2] G01B 9/02

U.S. Cl. 356—349 **10 Claims**

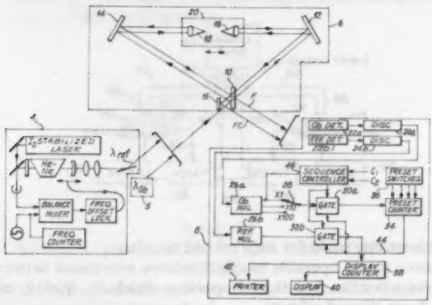

ACOUSTIC WAVE DERIVATION AND DEMODULATING MEANS
DEFLECTION OPTICS
BEAM-SPLITTER AND PHASE QUADRATURE REFERENCE BEAMS DERIVATION MEANS
OPTICAL PATH LENGTH MODULATING MEANS
RIGID REFERENCE MIRROR
PHOTODETECTOR AND SIGNAL TRANSLATING MEANS
LASER
TO CRT DISPLAY

1. In a system responsive to the intensity of radiated ultrasonic wave energy in a given frequency band, the combination comprising first means including photodetector and signal translating means, responsive to the simultaneous illumination thereof with respective first and second beams of coherent light of a predetermined wavelength each of which has an intensity component at a given frequency in said band, second means comprising an interferometer for simultaneously illuminating said photodetector and signal translating means with said first and second beams, said interferometer including a vibrating reference mirror, a displaceable signal mirror adapted to be insonified by said ultrasonic wave energy, and beam splitter and phase quadrature reference beam derivation means illuminated by said coherent light, said beam splitter and phase quadrature beam derivation means being cooperatively located with respect to said reference mirror and said signal mirror to derive as said first beam the interference between signal light reflected from an insonified spot of said signal mirror and first reference light reflected from said reference mirror that has a first temporal reference phase and to derive as said second beam the interference between said signal light and second reference light reflected from said reference mirror that has a second temporal reference phase substantially in quadrature with said first temporal reference phase, and means to directly derive an output signal having a magnitude in accordance with the displacement of said signal mirror comprising means to generate first and second intensity signals from said first and second beams, said intensity signals including respective quadrature modulation components derived from said vibrating reference mirror, means to derive from said intensity signals product terms representing respectively the signal mirror displacement multiplied by squared vibrating mirror quadrature components, and means to combine said last-derived terms so that the sum of the squared vibrating mirror quadrature components defines a constant-value coefficient for the signa mirror displacement magnitude.

4,165,183
FRINGE COUNTING INTERFEROMETRIC SYSTEM FOR HIGH ACCURACY MEASUREMENTS

John L. Hall, and Siu Au Lee, both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 26, 1977, Ser. No. 827,996
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—346 58 Claims



53. A method of measuring the wave number of an object beam of electromagnetic radiation using a reference beam in a Michelson-type interferometer comprising the steps of:

(a) directing said object and reference beams into said interferometer,

(b) detecting intensity fringes of said object and reference beams leaving said interferometer to produce electrical fringe signals,

(c) multiplying said electrical object fringe signals in a phase-lock loop multiplier to provide an L-fold multiplication thereof, thereby producing object submultiple signals, L being an integral number multiplier, and

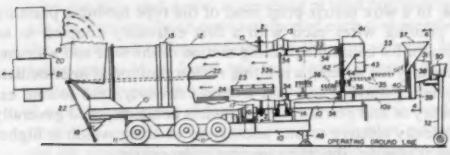
(d) counting said object submultiple signals while counting a given number of electrical fringe signals corresponding to said reference beam,

whereby said counted number of object submultiple signals corresponds to the wave number of said object beam.

4,165,184
APPARATUS FOR ASPHALTIC CONCRETE HOT MIX RECYCLING

Philip J. Schlarmann, Scotch Grove, Iowa, assignor to Iowa Manufacturing Company of Cedar Rapids, Iowa, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 808,991, Jun. 21, 1977, abandoned. This application Sep. 7, 1977, Ser. No. 831,154
Int. Cl.[2] B28C 5/20, 5/38, 5/42
U.S. Cl. 366—12 25 Claims

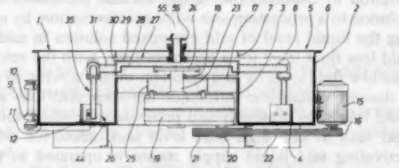


1. In apparatus for use in hot mix recycling in which aged asphaltic concrete pavement is removed and sized to provide an aged mix, then heated to a temperature less than the destructive temperature of its old asphalt but sufficient to at least begin its rejuvenation, and thereafter combined with heated fresh aggregate and fresh asphalt, the apparatus including a first drum having upstream and downstream axial ends, means for supporting the first drum in an attitude inclining downwardly in a direction from its upstream to its downstream end, means for rotating the first drum about its axis effective together with said inclination to move material introduced into the first drum adjacent its upstream end in said direction to adjacent the downstream end, means to assist retention of material introduced therein as aforesaid on and its elevation by the first drum interior walls during said material movement, and means disposed adjacent the downstream end of the first drum for removal of material therefrom, the improvement comprising: a second drum having corresponding upstream and downstream ends, a downstream portion of the second drum extending into an upstream portion of the first drum through the upstream end thereof, the downstream end of the second drum opening into the first drum, said upstream portion of the first drum spacedly enveloping said downstream portion of the second drum, material in the first drum being introduced into the space between said upstream and downstream portions of the first and second drums, the second drum being supported for rotation about its axis and for movement in said direction of material introduced into the second drum adjacent its upstream end to its downstream end and into the first drum for combination with material in the first drum; and means carried by the interior walls of the second drum effective to assist retention of material introduced therein as aforesaid on and its elevation by the second drum interior walls during said material movement.

4,165,185
MIXER, PREFERABLY FOR THE MIXING OF CONCRETE

Bernhard V. Fejmert, Nordostpassagen 19, 413 11 Göteborg, Sweden

Filed Feb. 17, 1978, Ser. No. 878,908
Claims priority, application Sweden, Feb. 17, 1977, 7701748
Int. Cl.[2] B01F 7/18; B28C 5/16
U.S. Cl. 366—65 7 Claims



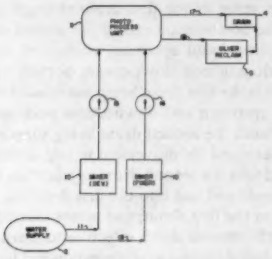
1. A mixer preferably for the mixing of concrete comprising an annular mixing tub having an outer wall and an inner wall defining a mixing space, a rotor means mounted above the center portion of said mixing tub, driving means operably connected to said rotor means for rotating said rotor means, agitating means having a number of agitators carried by said rotor means extending down into said mixing space of the mixing tub, said rotor means comprising a cylindrical case enclosing an inner space, said case extending substantially to said inner wall of said mixing tub and carrying on its periphery a plurality of hollow tubular arms each extending substantially in a radial direction and carrying one of said agitators, said arms being in communication with said inner space of said case, means for connection to a supply of liquid in communication with said inner space of said case, and means for feeding of liquid provided on said agitators, whereby liquid can be fed from said supply to the inner space of said case, to said tubular arms, to said agitators, and to a mixture in said mixing tub.

4,165,186

PHOTOGRAPHIC CHEMICAL MIXING SYSTEM

David J. Tortorich, New Orleans, La.; Lyle J. Bricker, 110 Gladys St., Fox River Grove, Ill. 60021, and John P. Yasenak, 832 Foxdale St., Winnetka, Ill. 60093, assignors to Lyle J. Bricker, Fox River Grove and John P. Yasenak, Winnetka, both of, Ill.

Filed Nov. 15, 1976, Ser. No. 741,628
Int. Cl.[2] B01F *5/12, 15/00*
U.S. Cl. 366—142 **13 Claims**



1. A photographic chemical mixer for supplying premixed chemical solution to a film processing unit, or the like, comprising: a fluid holding tank for said pre-mixed chemical solution; low level sensing means in said tank for detecting a preset low fluid level in said tank; high level sensing means in said tank for detecting a preset high fluid level in said tank; liquid supply means for adding diluting fluid to said tank which fluid is designed to be mixed with a concentrate to provide said pre-mixed chemical solution; control means associated with both said sensing means and said liquid supply means, and including indicating means operably connected with said low level sensing means for indicating the attainment of said low fluid level; means for selectively activating said liquid supply means; and means operably associated with said high level sensing means for deactivating said liquid supply means when said high fluid level in said tank is reached; and reservoir means adapted to contain a quantity of said pre-mixed chemical solution, said reservoir means being operably connected with said tank such that upon the liquid level in said tank reaching said low fluid level, said reservoir means will feed its premixed solution to continue the supply of said pre-mixed chemical solution to a processing unit without interruption, by maintaining the liquid level of said pre-mixed solution in said tank at said low fluid level for a period of time, with the retention of said low fluid level by said reservoir means serving to maintain a desired volumetric difference between said low and high fluid levels, to replenish said pre-mixed chemical solution, in said tank to said high fluid level said means for selectively activating said liquid supply means is operated to add said diluting fluid to the tank to be mixed with a pre-packaged concentrate added within said tank, said tank being filled to said high fluid level automatically to replenish the supply of pre-mixed chemical solution at the desired strength, said replenishing of the chemical solution being attained without the necessity of an operator having to measure said diluting fluid or commence the replenishing operation immediately upon attainment of said low fluid level.

4,165,187

APPARATUS FOR MIXING AND DISPENSING REACTIVE FLUIDS

James R. James, Plymouth, Mich., assignor to Accuratio Systems, Inc., Novi, Mich.

Filed Apr. 10, 1978, Ser. No. 894,992
Int. Cl.[2] B01F *15/00*
U.S. Cl. 366—150 **27 Claims**

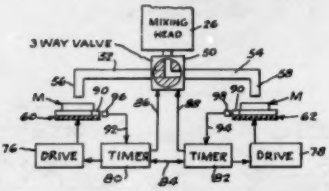
1. Apparatus for mixing reactive fluids and dispensing the resulting mixture into molds which comprises,

a source of each of a plurality of fluids,

a mixing head and means operable to furnish fluid thereto substantially continually from each of said sources for mixing,

said mixing head having an outlet, valving and a plurality of dispensing nozzles downstream of said outlet,

said valving being operable to direct a continuous flow of said mixture from said outlet to said nozzles in a predetermined sequence,



at least one mold for each of said nozzles,

motor means operable to effect relative movement between said nozzles and their respective molds to, during, and from aligned relation,

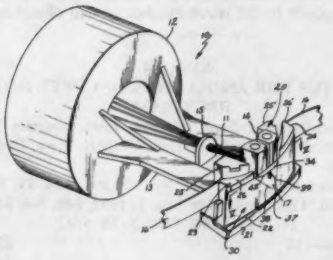
and means operable to synchronize operation of said valving with said relative movement so that substantially continually during operation of said apparatus said mixture is dispensed through at least one of said nozzles into a mold moving in alignment therewith.

4,165,188

RIBBON MASK AND GUIDE FOR DOT MATRIX IMPACT PRINTERS

William D. Rempel, Howell, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Feb. 17, 1977, Ser. No. 769,437
Int. Cl.[2] B41J *3/12, 31/12*
U.S. Cl. 400—124 **16 Claims**



6. In a wire matrix print head of the type having a plurality of printing wires each with a first extremity coupled to an actuator for causing a printing motion of the wire and a second extremity for striking a printing ribbon positioned intermediate a printing surface and said second extremity, said second extremity of said plurality of print wires being disposed generally vertically relative to one another in an array which is higher than it is wide, the improvement comprising:

a ribbon mask having at least portions positioned intermediate the printing surface and the printing ribbon for protecting the printing surface from undesirable contact by the printing ribbon; said ribbon mask having a thin sheet-like main body and mounting means for securing said ribbon mask to said print head; and said main body having an opening therethrough providing a path for the printing wires of the print head to pass through said ribbon mask and impact the printing surface, said ribbon mask opening

being generally oval in shape and narrower in width than in height, complementing the shape of the print wire array and having curved sides with a larger radius of curvature than the curved ends of the oval mask opening, the narrow width of the mask opening serving to reduce the amount of ribbon exposed to the print media to thereby reduce smudging and such narrowed width together with the larger-curvature sides of the opening facilitating movement of print media laterally relative to the mask with reduced snagging and catching of the media upon the sides of the mask opening.

4,165,189

CHARACTERS CARRYING DISC FOR A PRINTING MACHINE

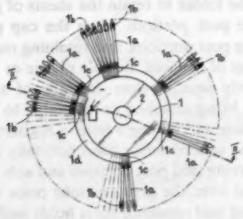
Alfred Bauer, Neuchâtel, Switzerland, assignor to Caracteres S.A., Neuchâtel, Switzerland

Filed Aug. 12, 1977, Ser. No. 823,946

Claims priority, application Switzerland, Jun. 8, 1977, 7087/77

Int. Cl.[2] B41J *1/30*

U.S. Cl. 400—144.2 **11 Claims**



1. A character-bearing disc for operation in a printing machine, comprising:

a hub having a central disc-like body portion and a perimetric edge portion formed about the periphery of the body portion, the perimetric edge portion being reduced in thickness relative to the central body portion of the hub;

resilient arm members formed integrally with the hub, the arm members extending radially from and connecting integrally to the perimetric edge portion of the hub;

means for reinforcing the portion of each arm member nearmost the hub, said means comprising at least one reinforcing rib disposed on an outward face of each arm member, the rib extending longitudinally of the arm member and being joined at an inner end to a facing portion of the central body portion adjacent the perimetric edge portion, the rib being joined along at least a portion of one edge thereof to a surface face of the perimetric edge portion, the rib extending radially of the perimetric edge portion beyond the periphery of said perimetric edge portion to contact and join to the arm member at a portion of said arm member adjacent the perimetric edge portion, the portion of the rib which extends beyond the outer periphery of the perimetric edge portion being of a radial length which is a minor portion of the radial length of the arm member; and,

means disposed on outer portions of the arm members for producing a printing impression.

4,165,190

SERIAL PRINTING APPARATUS

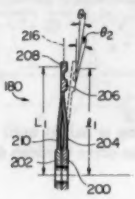
Takami Suzuki, and Nobuo Iwata, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 644,987, Dec. 29, 1975, Pat. No. 4,106,611. This application Nov. 16, 1977, Ser. No. 851,906

Claims priority, application Japan, Dec. 28, 1974, 50/1291; Aug. 6, 1975, 50/94954; Aug. 18, 1975, 50/99933

Int. Cl.[2] B41J *1/30*

U.S. Cl. 400—144.2 **3 Claims**



1. A rotary type wheel for use in a printing apparatus having a platen and a hammer means comprising:

a first and second rotary hub each having a common rotary axis, the first hub being generally bisected by a first plane perpendicular to the axis and the second hub being generally bisected by a second plane perpendicular to the axis, the first plane being axially spaced from the second plane and disposed between the second plane and the platen;

a plurality of resilient tongues extending generally radially from each rotary hub;

first type members provided on the tongues of said first rotary hub at a first radial distance L from the axis;

second type members provided on the tongues of said second rotary hub at a second radial distance L from the axis;

a selected tongue being bent by the hammer means from an unbent state to a bent position so that the type member of the selected tongue impacts against said platen;

said tongues having a configuration such that in their unbent state the first and second type members are disposed in a common plane perpendicular to said axis;

said second distance L being greater than said first distance L, whereby said first and second type members, are operable to strike the platen at the same point.

4,165,191

WEB FEED, WEB CUTTING AND RIBBON FEED MEANS FOR A STATIONERY MOSAIC PRINTER

Stanley J. Dickson, and Albert E. Castleton, both of Uxbridge, England, assignors to Control Systems Limited, Uxbridge, England

Filed Nov. 29, 1976, Ser. No. 745,827

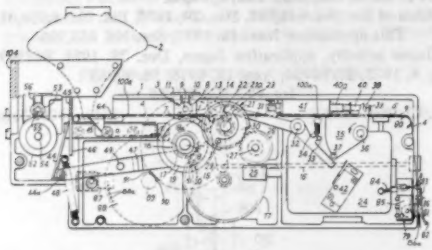
Claims priority, application United Kingdom, Dec. 2, 1975, 49528/75

Int. Cl.[2] B41J *13/02*

U.S. Cl. 400—636 **6 Claims**

1. A mosaic printer, comprising, stationary print head means including a plurality of needle print heads arranged in a row, means for feeding a ticket web one ticket length at a time to be printed with equispaced repeat ticket lengths in a direction orthogonal to the row of needle print heads, the print heads being arranged so that impact thereof causes visible dots to be formed on the surface of the web in a pattern which constitutes visual data, the web having holes therein spaced in the feed direction of the web, the feeding means comprising a drive motor, a rotatable drive member driven by the drive motor for engaging the web to thereby feed the web, said drive member comprising a rotatable drive disc having a flange extending radially of a portion of the periphery of the disc, and a one-revolution clutch connected between the motor and the drive member for driving the web for the one ticket length thereof,

the clutch being arranged so that the drive disc feeds the web until one of the holes therein is located adjacent the drive disc



whereupon the feeding is halted until the flange engages the sides of the one hole to drive the web for the one ticket length thereof.

4,165,192

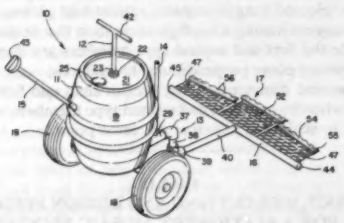
ASPHALT SPREADING MACHINE

Craig R. Mellen, 4243 S. 9th East, Salt Lake City, Utah 84117

Filed Dec. 29, 1975, Ser. No. 644,976

Int. Cl.[2] A46B *11/00, 17/02*

U.S. Cl. 401—48 **4 Claims**



1. An asphalt spreading machine for the pouring and spreading of hot asphalt in an even and uniform manner on roof surfaces, the machine comprising, in combination, an insulated cylindrical container securely mounted to an axle journaled in and supported by a pair of wheels, said container having two holes in the top end and one hole in the side near the bottom end, a funnel shaped aperture in one of the holes on the top end, a threaded flange in the other hole which is centered on the top end, a T-shaped handle which is threadably engaged to the flange on the top surface of the container and which is further provided on its bottom end with a pit-cock valve, a detachable handle for manually moving the asphalt spreading machine, a series of pipes and elbows extending outwardly of the container to permit the hot asphalt to pour through the system of pipes outwardly of the container, an air vent pipe affixed to the asphalt piping system to permit free flow of hot asphalt out of the pipes when the machine is turned off, a length of pipe with port holes on the bottom to permit hot asphalt to pour therethrough on to the roof surface, and a series of detachable screens and rakes for uniformly spreading the hot asphalt poured on the roof surface.

4,165,193

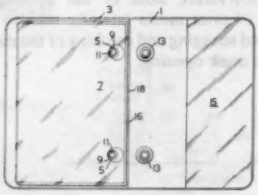
LOOSE-LEAF FOLDER

Alfred Gestetner, 2935 Brighton St., Montreal, Quebec, Canada, assignor to Alfred Gestetner, Canada

Filed Jul. 1, 1977, Ser. No. 812,426

Int. Cl.[2] B42F *13/12, 13/36*

U.S. Cl. 402—61 **6 Claims**



1. In a folder for the retension or protection of sheets of paper or similar material including:

a folder having two sides and a fold line between the two sides,

at least two spaced post portions of snap fasteners near the fold line of the folder and attached to and projecting inwardly from one side of the folder and adapted to pass through holes in the sheets of paper, and

at least two spaced cap portions of the snap fasteners adapted to cooperate with said post portions and removable to permit removal or insertion of sheets of paper from said folder,

the improvement wherein sheet retaining means are provided integral with the folder to retain the sheets of paper loosely in position on the post portions when the cap portions are removed from the post portions, said retaining means comprising a retaining sheet of resilient, flexible plastic or similar material of a size slightly smaller than one side of said folder, said retaining sheet being attached on one edge to the folder at or about the fold line and having a hole in register with each post portion whereby said retaining sheet normally overlies the side of the folder having said post portions and acts to retain a sheet of paper placed over the post portions prior to fastening the cap portions and said retaining sheet holds said sheets of paper in position while the side of the folder having the cap portions is uncapped.

4,165,194

FRICTIONAL COUPLINGS

Ralph F. J. Flower, "Littledean" Bath Rd., Devizes, Wiltshire, England

Filed Oct. 14, 1977, Ser. No. 842,103

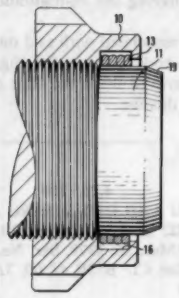
Claims priority, application United Kingdom, Oct. 16, 1976, 43078/76

Int. Cl.[2] F16B *21/00*

U.S. Cl. 403—320 **10 Claims**

4. A coupling assembly which comprises in combination a female member including an axially-extending bore, a male member for coupling therewith positioned axially within the bore in said female member but spaced therefrom, overlapping parts of the male and female members defining an annular clearance of a tapering radial dimension, and a frictional coupling member comprising a strip of resilient material of generally rectangular cross-section pre-formed into a multi-turn coil having a series of adjacent flats with corners therebetween thereby defining a regular polygonal shape considered in the plane normal to the coil axis, a groove provided in the overlapping part of one of the external surface of the male member and the internal surface of the bore in the female member in which groove said coil is located, external corners of the polygonal multi-turn coil contacting the female member and the internal flats of the multi-turn coil contacting the male member

whereby the frictional coupling element frictionally connects the male member and the female member as the clearance



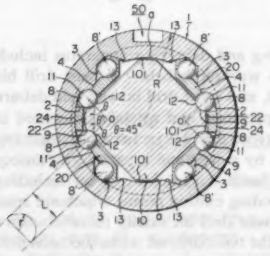
between the overlapping parts of the members is reduced by relative axial movement therebetween.

4,165,195

RECIRCULATING BALL BEARING SPLINE JOINT

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan (158)

Filed Jul. 17, 1978, Ser. No. 924,893
Claims priority, application Japan, Sep. 6, 1977, 52-118944[U]
Int. Cl.[2] B25G *3/28*; F16B *3/00, 7/00*
U.S. Cl. 403—359 **5 Claims**



1. A unit of a ball spline and a shaft having a polygonal cross section, the ball spline including an outer sleeve formed in its inner peripheral surface with ball-circulating grooves in vertically or horizontally symmetrical disposition, two separated holders each having an angle slightly larger than an angle α when assembled in the outer sleeve and holding a desired number of balls, the holders assembled in the outer sleeve with being inflected inwardly, and a pair of holder retainers fitted to the opposite opening ends of the outer sleeve; and the shaft formed with four ball-circulating grooves in the opposite sides of its opposite two sides and inserted in the ball spline.

4,165,196

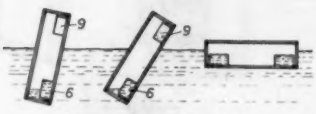
METHOD OF CONSTRUCTING A COLUMN FORMED FROM ANNULAR ELEMENTS AND ELEMENTS FOR THE APPLICATION OF SAID METHOD

Francisco de Assis M. Serrano, Issy-les-Moulineaux, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous Marines "C.G. Doris", Paris, France

Filed Apr. 14, 1978, Ser. No. 896,610
Claims priority, application France, Apr. 14, 1977, 77 11233
Int. Cl.[2] E02D *21/00*
U.S. Cl. 405—205 **10 Claims**

1. A method of constructing a hollow column from a plurality of annular elements, said column being intended more particularly to rest on a base bearing on a submarine bed and to support a deck carrying production or research installations, comprising the following sequence of operations:

(a) simultaneously constructing at least one section of each of a number of annular elements from which the column is to be formed,
(b) forming an impervious closure at one end of each of said sections,
(c) placing a first impervious caisson inside each of said sections adjacent said one end thereof,
(d) causing said sections to float in water,
(e) simultaneously finishing the construction of said elements,



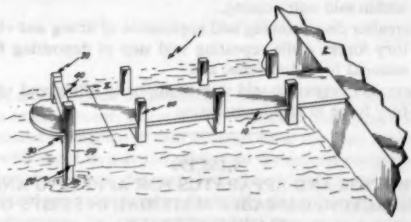
(f) placing a second impervious caisson inside each of said elements adjacent the other end thereof,
(g) forming an impervious closure at the other end of each of said elements,
(h) bringing the elements into the horizontal position by ballasting the caissons with water,
(i) assembling the elements and fixing them together to form the column, and
(j) dismantling those of the caissons and closures that are not required to be used when placing the column into position on a submarine bed.

4,165,197

METHOD AND APPARATUS FOR INSTALLING A DOCK

Randall F. Postma, 2570 Sun Valley, Jenison, Mich. 49428

Division of Ser. No. 781,787, Mar. 28, 1977. This application Sep. 11, 1978, Ser. No. 940,972
Int. Cl.[2] E02B *3/20*; B63B *35/00*
U.S. Cl. 405—218 **19 Claims**



1. A method for installing a dock comprising: providing an elongated jig having a pair of legs adjustably secured thereto near one end thereof, said jig having a length at least as long as the distance which the pilings of the dock to be installed must be located from the next adjacent support means for the dock; placing said jig in position with one end supported on the next adjacent support means for the dock to be installed and with the other end out over the water with said legs extending down into the water; adjusting the level of said legs with respect to said jig until said jig is at the desired level and height; providing said jig with a piling guide comprising a frame for at least partially enclosing a piling located therein, said frame having dimensions closely approximating the lateral cross sectional dimensions of a piling whereby said frame will serve as a guide for a piling as it is sunk into the ground below the water; providing a piling and lifting said piling out over the water and placing it within said piling guide; providing means for sinking said piling and sinking said piling into the ground below the water until it reaches a predetermined desired height; removing said jig after said piling is set in place; securing one end of

a platform to said piling and the other end to the next adjacent support means to thereby create a dock.

4,165,198

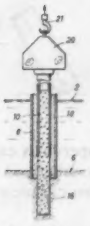
METHOD FOR FORMING PIER FOUNDATION COLUMNS

Glyen D. Farmer, Houston, Tex., assignor to Farmer Foundation Company, Houston, Tex.

Continuation-in-part of Ser. No. 720,694, Sep. 7, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 845,857

Int. Cl.[2] E02D *5/40*

U.S. Cl. 405—243 **12 Claims**



1. A method of forming a concrete foundation column, comprising the steps of

erecting an outer casing and the like at a preselected location,

erecting an inner molding casing and the like at said location and substantially concentrically within said outer casing,

depositing concrete in said inner casing,

depositing an unconsolidated filler material within the annulus between said casings to a level sufficient to create viscous drag forces great enough to grippingly immobilize said inner casing within said outer casing, applying to said inner casing a lifting force greater than the weight of said inner casing and a vibratory force to cancel said viscous drag forces thereon to partially raise said inner casing within said outer casing,

thereafter discontinuing said application of lifting and vibratory forces while repeating said step of depositing filler material in said annulus, and

thereafter repeating said step of applying lifting and vibratory force to said inner casing.

4,165,199

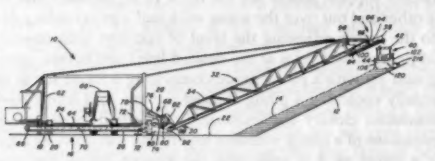
PROCESS AND APPARATUS FOR APPLYING AND COMPACTING CASTABLE MATERIAL IN STRIPS ON A SLOPED SURFACE

Perry J. Dick, Jr., Pittsburgh, Pa., assignor to Trumbull Corporation, Pittsburgh, Pa.

Division of Ser. No. 784,073, Apr. 4, 1977. This application May 19, 1978, Ser. No. 907,560

Int. Cl.[2] E01C *19/26*; E02D *3/02*

U.S. Cl. 405—271 **5 Claims**



1. Apparatus for compacting a strip of castable material comprising,

roller means for compacting the strip to a preselected degree of compaction,

propelling means for advancing said roller means longitudinally on the strip,

said roller means having a cylindrical body portion with one end portion having the configuration of a frustum of a cone, and

forming means associated with said one end portion of said roller means body portion for engaging a longitudinal edge of the strip to shape the edge of the strip to form a curved edge thereon.

4,165,200

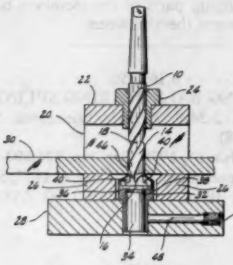
DRILLING AND DEBURRING APPARATUS

Lyle M. Taylor, 523 Lind St., Quincy, Ill. 62301

Filed Mar. 16, 1978, Ser. No. 887,028

Int. Cl.[2] B23B *41/00, 51/08*

U.S. Cl. 408—118 **9 Claims**



1. A drilling and deburring apparatus including means for supporting a workpiece below a twist drill bit and above a deburring bit, said twist drill bit and said deburring bit axially aligned in opposition and rotatably mounted in said support means, said twist drill bit including at least two longitudinal flutes joined by a web and separated by an equal number of longitudinal lands, said deburring bit including at least two radially extending cutting means which are spaced to pass the web of the twist drill bit axially therebetween and to engage the flutes of the twist drill bit when the twist drill bit is rotated, each of said cutting means projecting radially outwardly from adjacent the bottom of the adjacent flute to substantially beyond the diameter of the twist drill bit.

4,165,201

DEBURRING TOOL FOR DEBURRING BORES

Peter Heule, Grünenstein, Balgach, Switzerland

Filed Oct. 27, 1976, Ser. No. 736,101

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1975, 2548214

Int. Cl.[2] B23D *77/00*

U.S. Cl. 408—187 **15 Claims**

1. A deburring tool for deburring work pieces having bores, the tool comprising in combination:

a tool holder,

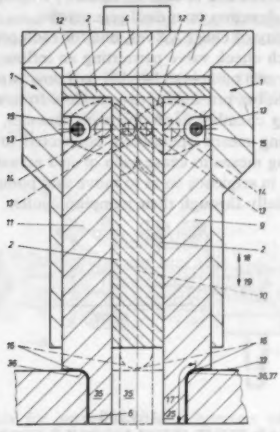
a plurality of knives being mounted in the tool holder for longitudinal movement therein,

the tool characterized by:

each knife having sensing means which senses the edge of the bore hole and a cutting edge adapted for entering the bore;

interconnecting means joining all of the knives whereby the opposite knives act in unison with each other in longitudinal movement within the toolholder and opposite the action of the adjacent knives,

the sensing means of at least one knife adapted to engage the edge of the bore hole and automatically control the position of the remaining knives by action of the interconnecting means.

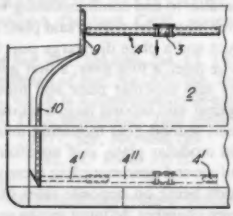


4,165,202

APPARATUS FOR EMPTYING BULK MATERIAL FROM A STORAGE CHAMBER

Kaare Haahjen, Vigra, Norway, assignor to Haahjem Mekanishe A/S, Vigra, Norway

Division of Ser. No. 870,253, Jan. 17, 1978. This application Apr. 21, 1978, Ser. No. 899,530
Claims priority, application Norway, Jan. 17, 1977, 770132
Int. Cl.[2] B65G *65/38*
U.S. Cl. 414—313 6 Claims



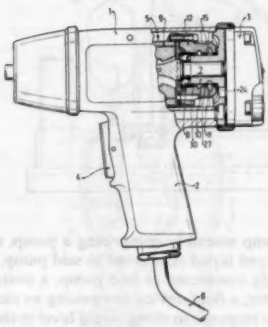
1. Apparatus for emptying bulk material from a storage chamber, said apparatus comprising rake means in said storage chamber for transporting material in the storage chamber in one direction therein for external discharge from said chamber, a guide beam in said chamber extending transversely with respect to said one direction, means supporting said rake means on said guide beam for slidable movement thereon, means supporting said guide beam for vertical movement thereof, said guide beam including means for varying the length thereof for adapting the length of the guide beam to varying width of the storage chamber.

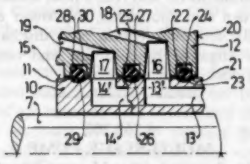
4,165,203

PRESSURIZED MEDIUM POWERED DEVICE

Kurt Latzina, Waldenbuch; Hans Martin, Leinfelden, and Richard Wolf, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 30, 1976, Ser. No. 728,399
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1975, 7534297[U]
Int. Cl.[2] F03B *13/04*
U.S. Cl. 415—113 20 Claims





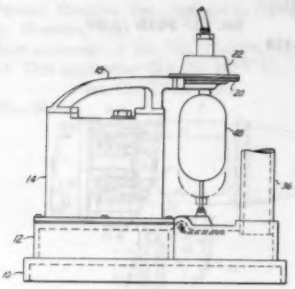
1. A motor driven by pressurized fluid, the motor comprising an external rotor; at least two components including a first component connected to said external rotor for joint rotation therewith about an axis and relative to the second component, the first component defining with the second component a cylindrical gap extending longitudinally along the axis, each of the components having one channel for passage of a pressurized fluid therethrough, said channels of the components communicating with one another across the gap; and sealing means for sealing said channels from leakage of pressurized fluid through the gap, said sealing means comprising two annular sealing elements, one of the components having two annular grooves axially spaced from each other and communicating with the gap, said one component having four sidewalls each pair of which define a part of one of the annular grooves, each sidewall of each pair being at least substantially parallel to the other sidewall of the pair, each pair of sidewalls including an axially remote sidewall bounding the gap, said one respective channel of each component being axially intermediate said two annular grooves, and said two sealing elements each being receivable with axial and radial play within a respective one of said grooves and in the gap, said sealing elements each being pressed against the axially remote sidewall in such a manner as to block the gap and thereby prevent leakage of pressurized fluid as pressurized fluid passes through said communicating channels.

4,165,204

SUMP PUMP

Axel L. Nielsen, 1316 E. Elza, Hazel Park, Mich. 48030

Filed Nov. 16, 1977, Ser. No. 851,842
Int. Cl.[2] F04B *49/04*
U.S. Cl. 417—40 **7 Claims**



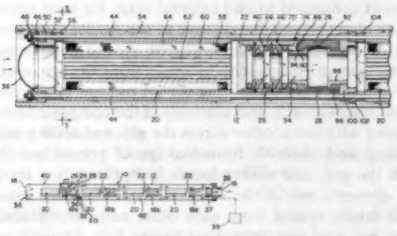
1. A sump pump assembly comprising a pump, a discharge passage for pumped liquid connected to said pump, an electric motor operatively connected to said pump, a switch for controlling said motor, a float device comprising an element movable upwardly in response to rising liquid level in the sump and operable thereby to close said switch, and a leaf movably mounted in said discharge passage for movement by the flow of pumped liquid therein to a position in which it engages said element and prevents return of said element to switch opening position, said element comprising a vertical switch actuating rod, spaced abutments on said rod, a float slidable vertically on said rod between said abutments, the lower end of said rod being vertically movable within said discharge passage in position to be engaged by said leaf and retained in upper switch-closing position by said leaf.

4,165,205

MULTI-STAGE PUMP

Carl L. Otto, Jr., deceased, late of Lummi Island, Wash., and by Phyllis Lockwood, executrix, 2095 W. Shore Dr., Lummi Island, Wash. 98262

Filed May 19, 1977, Ser. No. 798,462
Int. Cl.[2] F04B *3/00, 17/04, 21/02*
U.S. Cl. 417—262 **10 Claims**



1. A multi-stage pump assembly comprising:

a. housing means having an intake pumping chamber and a plurality of additional pumping chambers arranged in series for liquid flow into said intake pumping chamber and sequentially through the additional pumping chambers,

b. a plurality of pumping elements, each having a downstream face exposed to pressurized fluid from an immediately adjacent downstream pumping chamber and an upstream face exposed to liquid pressure from an immediately adjacent upstream pumping chamber,

c. a plurality of separately operable actuating means, one for each of said pumping elements to move its related pumping element in a pumping cycle in a first direction on an intake stroke and to urge its related pumping element in a second direction on a discharge stroke,

d. a plurality of check valves, one for each pumping chamber, each check valve permitting an inflow of fluid from an upstream pumping chamber to a downstream pumping chamber, but preventing reverse flow from a downstream pumping chamber to an upstream chamber,

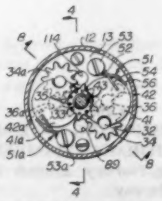
e. activating means operatively connected to each of said actuating means to cause each of said actuating means to operate in sequence so as to move said pumping elements sequentially through their pumping cycles.

4,165,206

THREE GEAR PUMP WITH MODULE CONSTRUCTION

Thomas B. Martin, Pleasant Hill, and Ferdinandus A. Pieters, Walnut Creek, both of Calif., assignors to Micropump Corporation, Concord, Calif.

Continuation-in-part of Ser. No. 763,523, Jan. 28, 1977, Pat. No. 4,127,365. This application Jun. 8, 1977, Ser. No. 804,766
Int. Cl.[2] F04C *1/08, 15/00;* F04B *49/02, 35/00*
U.S. Cl. 417—310 **17 Claims**



1. A pump comprising a manifold having a parting surface formed with a discharge duct and an inlet duct and outlet and inlet ports, respectively, from the exterior of said manifold to said ducts, a modular plate having first and second faces, said first face being parallel to and communicating with said parting surface, at least one plate inlet port in said plate communicating with said inlet duct and a plate discharge port communicating with said discharge duct, a first gear, a first gear shaft fixed to and supported by said modular plate and mounting said first gear rotatable against said second face, a second gear meshing with said first gear, second gear mounting means fixed to and supported by said modular plate, said manifold being discrete from said first and second gear mounting means, said plate inlet and discharge ports being on opposite sides of the mesh point on said gears, pump chamber defining means sealing relative to said modular plate to enclose a space outward of said second face which includes said plate inlet port and at least that portion of said first and second gears that includes said mesh point and at least two teeth of each gear to either side of said mesh point, and drive means for rotating one of said gears, said pump chamber defining means comprising an imperforate shoe mounted on said modular plate overlying said plate inlet port and a portion of said gears opposite said modular plate to either side of said mesh point, said shoe mounted on said modular plate comprising a disk formed with a first recess for rotation of said gears and a second recess communicating with said first recess and with said plate inlet port.

4,165,207

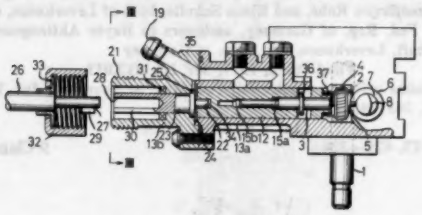
ACTUATION DEVICE FOR A TACHOMETER FOR AN ENGINE

Tetsuzo Fujikawa, Kobe, and Ryoji Uda, Kakogawa, both of Japan, assignors to Kawaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 687,644, May 18, 1976, abandoned. This application Jan. 11, 1978, Ser. No. 868,546

Int. Cl.[2] F16N *13/04*

U.S. Cl. 417—313 2 Claims



1. Apparatus for actuating the tachometer of an engine comprising an oil pump assembly for supplying oil to said engine, said oil pump assembly including plunger means mounted for both rotative and reciprocal movement within said oil pump assembly, connection means for connecting said plunger means to the drive shaft of an engine to enable said plunger means to be rotatively driven by said engine drive shaft, said connection means including a speed reducing mechanism interposed between said plunger means and said engine drive shaft to effect rotative driving of said plunger means at a reduced speed relative to the speed of said engine drive shaft, cam means interposed between said plunger means and a throttle lever of said engine to enable said plunger means to be reciprocally moved by said throttle lever, and a cable connected to said plunger means and adapted to be connected to a tachometer for transmitting rotary motion from said plunger means of said oil pump assembly to said tachometer, said plunger means being formed with a pair of plunger members, one of said plunger members being reciprocally driven through said cam means and rotatively driven through said speed reducing mechanism, and the other of said plunger members being connected with said cable, said other plunger member being connected to said one plunger member to receive only rotary motion therefrom.

4,165,208

INTRAVENOUS DELIVERY PUMP

Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.

Continuation of Ser. No. 704,540, Jul. 12, 1976, abandoned, which is a continuation of Ser. No. 431,753, Jan. 8, 1974, Pat. No. 3,874,826, which is a continuation-in-part of Ser. No. 329,425, Feb. 5, 1973, abandoned. This application Dec. 15, 1977, Ser. No. 860,789

Int. Cl.[2] F04B *39/10*

U.S. Cl. 417—565 23 Claims

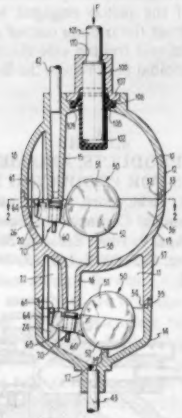
1. A pump for the precise metering of liquids for delivery to a patient comprising:

(a) a non-deformable inlet chamber having an inlet thereto and an outlet duct therefrom and means forming a flow passage in communication with the outlet duct and adapted to be connected to the patient;

(b) a one-way valve cooperating with said inlet;

(c) a substantially incompressible displacement piston having a first end portion always projecting inwardly through an opening in one wall of said inlet chamber and a second end portion which remains outside said inlet chamber, said second end portion always projecting outwardly through the opening in the wall and being adapted for engagement by piston means, said piston being adapted for reciprocating movement in a direction inwardly of the inlet chamber from a first retracted position to a second projected position and then outwardly to said first position, the movement of said piston from said first position to said second position causing the discharge of a precise quantity of liquid from said inlet chamber through said outlet duct and the return movement of said piston from said second position to said first position causing further liquid to be drawn into said inlet chamber through said inlet so that said inlet chamber remains filled with liquid; and

(d) a flexible sheath of resilient material enclosing and in



tight-fitting engagement with the entire portion of said piston which is inside said inlet chamber, a portion of said sheath being in air-tight engagement with the adjacent portion of said one wall of said inlet chamber in contact therewith and having sealing means for preventing the admission of air between said sheath and that portion of said piston enclosed by and in contact therewith, said sheath remaining in continuous contact with the entire portion of said piston which is inside the inlet chamber during movement of said piston between said first and second positions.

4,165,209

EXTERNAL AXLE ROTARY PISTON MACHINE

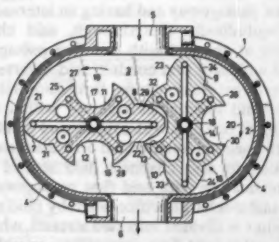
Dankwart Eiermann, Lindau, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,137

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635972

Int. Cl.[2] F04C *29/00*

U.S. Cl. 418—190 1 Claim



1. A 1:1 ratio external axle rotary piston machine which comprises in combination: pistons which intermesh with one another, each of said pistons having two respectively oppositely located truncated teeth with corners as well as a base and

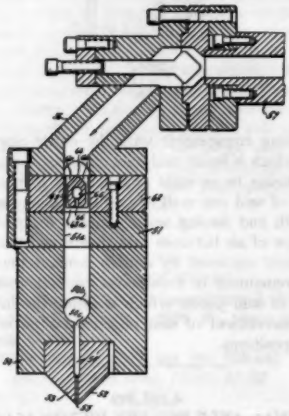
two respectively oppositely located recesses with corners interposed between said teeth, said pistons being arranged in such a way that alternately one tooth of one piston engages one recess of another piston and vice versa, that entire flank of each tooth having a side which trails in the direction of rotation of the pertaining piston being provided with a contour and being set back with respect to the cycloidal path described by the trailing corner of the pertaining recess of the piston engaged by said tooth, each recess being deeper than the path of the corners of the pertaining engaging tooth, said contour of said set back trailing flank of each tooth being approximately parallel to said cycloidal path described by the trailing corner of the pertaining recess of the piston engaged by said tooth, said contour extending from the trailing corner of said tooth to the base of said tooth on said trailing side thereof, said base coinciding with said cycloidal path where the latter intersects with the piston.

4,165,210

LAMINATED PRODUCTS, AND METHODS AND APPARATUS FOR PRODUCING THE SAME

Herbert O. Corbett, Bridgeport, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 9, 1964, Ser. No. 350,220
Int. Cl.² B29F *3/01, 3/04*
U.S. Cl. 425—133.5 **6 Claims**



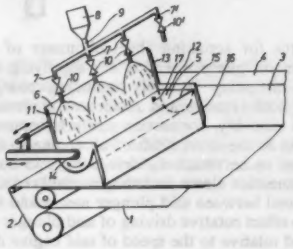
1. An apparatus for extruding laminated plastic products comprising an extrusion die defining a first passageway for fluid materials, said first passageway having a narrow, elongated discharge orifice, a first extruder, a second extruder, a first conduit having one end connected to said first extruder, a second conduit having one end connected to said second extruder, a flow dividing means comprising a solid diverter and two spaced channels, said diverter extending completely across said first passageway and having an internal passageway extending longitudinally therethrough, said channels each communicating at one end with said first passageway and at the other end with said first conduit, said diverter being positioned so as to direct fluid material from said first conduit into said channels, said internal passageway within said diverter communicating at one end with said second conduit and at its other end with a second longitudinal orifice situated intermediate and parallel to said channels, said second longitudinal orifice communicating with said first passageway at a point remote from said discharge orifice whereby fluid material from said first conduit is divided into two streams which are laminarly joined within said first passageway to either side of a central stream of fluid from said second elongated orifice, said first passageway merging into an intermediate portion of reduced width which communicates directly with the elongated discharge orifice whereby the laminated materials being extruded through said first passageway will be laminarly reduced in thickness and extended longitudinally prior to entering into said elongated discharge orifice.

4,165,211

APPARATUS FOR APPLYING A LAYER OF A LIQUID FOAMABLE REACTION MIXTURE TO A CONTINUOUSLY MOVING SUPPORT

Wilfried Ebeling, Cologne; Volker Onnenberg, Wiel; Alberto C. Gonzalez-Dörner, Leverkusen; Bernd Lehmann, Cologne; Hansjürgen Rabe, and Klaus Schulte, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,011
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631145
Int. Cl.² B29D *27/04*
U.S. Cl. 425—224 **9 Claims**



1. An apparatus for the application of a layer of foamable liquid reaction mixture to a continuously moving support, comprising: a continuously moving support and at least one conduit with an outlet and a deflector plate for the preliminary distribution of the reaction mixture transversely to the direction of movement of the support, the outlet from said at least one conduit being arranged above a distributor channel which extends transversely of the direction of travel of the support and which functions as a place of intermediate storage, the arrangement being such that the reaction mixture enters the distributor channel in the form of a film, at least one side of which is exposed to the atmosphere, and said deflector plate is located between said outlet and said distributor channel.

4,165,212

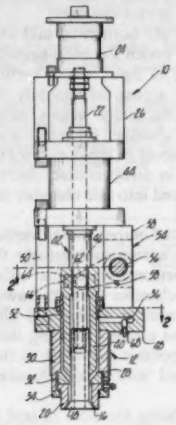
MULTIPLE EXTRUSION HEAD ASSEMBLY

William E. Ziegler, Ann Arbor, Mich., assignor to Hoover Universal, Inc., Saline, Mich.

Filed Mar. 2, 1978, Ser. No. 882,646
Int. Cl.² B29D *23/04*
U.S. Cl. 425—382 R **8 Claims**

1. An extrusion head assembly comprising a plurality of extrusion heads for extruding tubes of plastics material, each extrusion head having an annular outlet orifice, an inlet passageway for receiving plastics material from a screw extruder, an accumulator chamber in communication with said outlet orifice and said inlet passageway for accumulating plastics material from said screw extruder, and discharge means for intermittently discharging the accumulated plastics material through said outlet orifice to form said tubes, and a mechanism connected to each of said discharge means synchronizing the operation of said discharge means so that the tubes of plastics material are discharged from each head synchronously, said mechanism interconnecting the plungers so that if the plastics material tends to flow to one accumulator chamber with greater ease than to a second accumulator chamber the plastics

material acting on the one plunger will then tend to move the second plunger also thereby increasing the back pressure of the



plastics material to said one accumulator chamber to balance the flow to the accumulator chambers.

4,165,213

APPARATUS FOR MULTI-STAGE BLOW MOLDING OF HOLLOW SHAPED ARTICLES

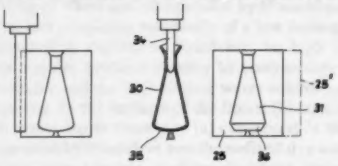
Gottfried Mehnert, Messelstrasse 25, D-1000 Berlin 33, Fed. Rep. of Germany

Division of Ser. No. 622,020, Oct. 14, 1975, Pat. No. 4,066,726, which is a continuation of Ser. No. 415,806, Nov. 14, 1973, abandoned. This application Jul. 1, 1977, Ser. No. 812,367

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1972, 2256683; Oct. 30, 1973, 2354214

Int. Cl.² B29D *23/03*

U.S. Cl. 425—530 **8 Claims**



1. Apparatus for converting parisons into hollow shaped articles, comprising an extrusion machine arranged to extrude a succession of parisons substantially vertically downwardly; blowing means comprising at least one blowing mandrel; first mold means arranged to receive parisons and to cooperate with said blowing mandrel for conversion of parisons into hollow preforms; second mold means arranged to receive preforms while such preforms are supported by said blowing mandrel and to cooperate with said blowing mandrel for conversion of performs into hollow shaped articles; means for effecting a relative movement between said first and second mold means and said blowing mandrel to transfer parisons into said first mold means and to transfer said preforms into said second mold means while the preforms are supported solely by said blowing mandrel, said second mold means and said blowing mandrel being out of register with said machine at all times; and means for opening and closing said first and second mold means independently of each other.

4,165,214

APPARATUS FOR PRODUCING CORRUGATED THERMOPLASTIC TUBING

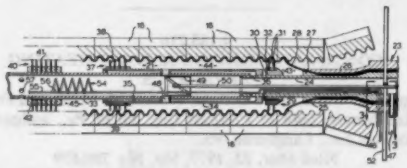
Gerd P. H. Lupke, 46 Stornoway Crescent, and Manfred A. A. Lupke, 35 Ironshield Crescent, both of Thornhill, Ontario, Canada

Filed Dec. 21, 1977, Ser. No. 865,019

Claims priority, application Canada, Sep. 13, 1977, 286652

Int. Cl.² B29D *23/03*

U.S. Cl. 425—532 **5 Claims**



1. Apparatus for producing corrugated thermoplastic tubing, the apparatus comprising a pair of complementary mold assemblies each having an endless array of articulately interconnected mold blocks, drive means for driving the mold blocks in synchronism along a forward run in which the mold blocks of the mold assemblies are in cooperative interengagement to provide an axially extending tubular mold tunnel having a corrugated wall, and back along a return run, an extrusion head disposed at the entrance to the tubular mold tunnel for forming a tube of thermoplastic material, a plurality of gas sealing arrangements mounted within the tubular mold tunnel in axially spaced relationship, said gas sealing arrangements cooperating with said tube of thermoplastic material to define successive first, second and third pressurizable zones therein, gas supply means for supplying pressurized gas at a first pressure to the first zone for supporting the tube against the tunnel wall, and for supplying pressurized gas at different, successively greater, pressures to the second and third zones for urging the tube of thermoplastic material outwardly into the corrugations in the wall of the mold tunnel, means defining a gas leakage path between said second and third zones to permit leakage of gas from the third zone to the second zone, and vent means communicating with the second zone for controlling the exhaust of gas therefrom to maintain the gas pressure in the second zone less than the gas pressure in the third zone by a controlled amount.

4,165,215

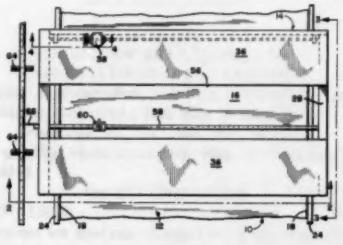
SLAB PREPARATION APPARATUS

Herman C. Himes, Akron, and John P. Koepnich, Cuyahoga Falls, both of Ohio, assignors to Price Brothers Company, Dayton, Ohio

Filed Feb. 22, 1978, Ser. No. 880,195

Int. Cl.² B28B *7/00*

U.S. Cl. 425—169 **7 Claims**



1. In apparatus for preparing a precast concrete slab includ-

ing a relatively long, narrow casting bed and tracks extending along opposite sides of said bed, the improvement comprising:

a lay-out cart including a deck spanning said bed transversely thereof,

means for moving said cart along said tracks,

means defining an opening through said deck providing access from said deck to said bed,

said opening having a width no less than the width of said bed, and

indexing means associated with said cart for indicating positions relative to said bed.

4,165,216

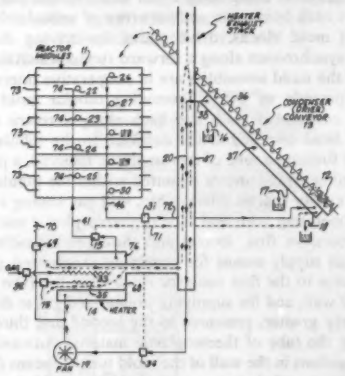
CONTINUOUS DRYING AND/OR HEATING APPARATUS

Eugene W. White, State College; Francis M. Gross, and Fred E. Knoffsinger, both of Pleasant Gap, all of Pa., assignors to Enerco, Inc., Langhorne, Pa.

Filed Mar. 23, 1977, Ser. No. 780,679

Int. Cl.[2] **C10B** *49/02, 1/04;* **F26B** *3/14, 17/12*

U.S. Cl. 432—102 **2 Claims**



1. A reactor for the heating or drying of powders, grains, chips, and other feed materials comprising:

a chamber for containing the feed material to be heated or dried;

inlet means at the top of said chamber for depositing said feed material in said chamber;

outlet means at the bottom of said chamber for removing feed material which has been heated or dried;

a uniform array of input means vertically disposed within said chamber across substantially the entire length and extending horizontally across substantially the entire width of said chamber for introducing hot gases therein, said uniform array of input means extending through said feed material in direct contact therewith so that said hot gases introduced into said chamber uniformly contact said feed material;

a uniform array of output means vertically disposed within said chamber across substantially the entire length and extending horizontally across substantially the entire width of said chamber for withdrawing said hot gases and any gases produced within said chamber, said uniform array of output means extending through said feed material in direct contact therewith so that said hot gases and gases produced within said chamber may be uniformly collected;

means for regulating the flow of said hot gases introduced into said chamber through said uniform array of input means;

means for pre-heating or drying said feed material prior to depositing said feed material in said chamber;

means for conducting said hot gases and said gases produced within said chamber away from said chamber, said means for conducting being connected with said pre-heating or drying means so that heat derived from said hot gases and gases produced within said chamber is used to accomplish pre-heating or drying;

means for regulating the flow of said hot gases and gases produced within said chamber and withdrawn therefrom through said uniform array of output means and conducted to said pre-heating and drying means through said conducting means; and

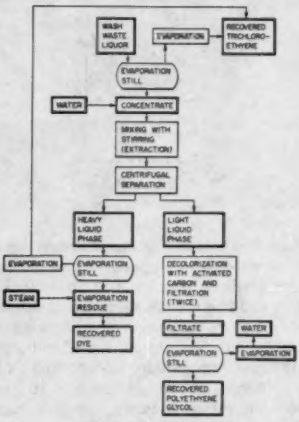
means for burning combustible gases included within said hot gases and gases produced within said chamber, said means for burning communicating with said pre-heating or drying means so that gases enter said means for burning after passing through said pre-heating or drying means.

4,165,217

HALOHYDROCARBON TREATMENT OF A GLYCOL AND WASTE DYE LIQUOR FOLLOWED BY WATER EXTRACTION OF THE GLYCOL

Kazuo Kitamura, Mukou; Fumiki Takabayashi, Takatsuki; Fumio Shibata, Uji; Kaname Watabe, Takatsuki, and Toshinori Azumi, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 357,896, May 7, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,307
Claims priority, application Japan, May 9, 1972, 47-45052
Int. Cl.[2] D06P *5/00*
U.S. Cl. 8—81 5 Claims



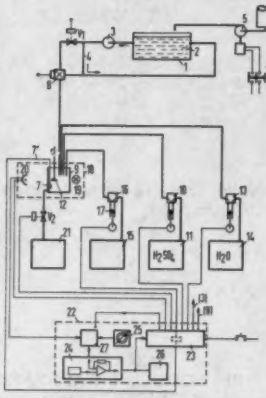
1. A method for treating a wash waste liquor, which comprises (a) continuously treating fibers which have been dyed by applying a dye liquor containing a solution or dispersion of a non-ionic disperse or oil-soluble dye in a high boiling water-soluble organic medium selected from the group consisting of polyalkylene glycols and alkyl ether of polyalkylene glycols or a mixture of said polyalkylene glycol or alkyl ether of polyalkylene glycol with a low boiling medium selected from the group consisting of water and halogenated hydrocarbons, with a washing medium consisting essentially of a low boiling halogenated hydrocarbon capable of dissolving the high boiling water-soluble organic medium thereby to continuously wash out the unfixed dye and the high boiling water-soluble organic medium remaining on the surfaces of the fibers; (b) concentrating the wash waste liquor from step (a) comprised of the low boiling halogenated hydrocarbon and the unfixed dye and high boiling water-soluble organic medium dissolved therein by evaporating the low boiling halogenated hydrocarbon contained therein until the content of said halogenated hydrocarbon in the residual concentrate becomes substantially 30 to 90% by weight; (c) mixing the resulting concentrate consisting of the high boiling water-soluble organic medium, the dye and the low boiling halogenated hydrocarbon with 0.8 to 20 parts by weight of water, per part by weight of the high boiling water-soluble organic medium in the residual concentrate to extract the high boiling water-soluble organic medium, thereby to separate it into a phase consisting of an aqueous solution of the high boiling water-soluble organic medium and a phase consisting of the low boiling halogenated hydrocarbon and the dye dissolved or dispersed therein; (d) thereafter separating the two phases, recovering the low boiling halogenated hydrocarbon by evaporation and obtaining the dye as residue from the phase consisting of the low boiling halogenated hydrocarbon and the dye; and (e) removing the remaining low boiling halogenated hydrocarbon from the residue by blowing steam into the dye-containing residue and boiling the remaining low boiling halogenated hydrocarbon together with water.

4,165,218

MONITORING SURFACTANT IN ELECTROLYTE DURING METAL TREATMENT

Jacky Vanhumbeeck, Brugge, and Christiaan Vandenbossche, Zwijnaarde, both of Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,045
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650572
Int. Cl.[2] G01N *31/16, 21/02;* C25D *3/30*
U.S. Cl. 23—230 R 4 Claims



1. In a method for the quantitative monitoring of a nonionic surfactant, in an acid tinning bath of the type employed for the production of shiny, pore-free coatings on component parts, in which method a measured sample of bath fluid is diluted with distilled water, mixed with an acid, and the resulting mixture is titrated with a tannic acid solution until opalescense persists, the improvement which comprises the steps of:

(A) mixing with such a sample of bath fluid sulfuric acid as such acid,

(B) then mixing therewith distilled water,

(C) then automatically adding tannic acid to the resulting sample of bath fluid while concurrently monitoring such resulting sample photometrically, said tannic acid being so added as an aqueous solution to such resulting sample at a constant rate and at constant intervals of time, and the corresponding difference in the output voltage photometrically being measured in each interval of no tannic acid addition, and then, when a constant voltage difference is found between two successive such measurements,

(D) calculating the proportionality factor between such voltage difference and the titration volume and determining the lowest value for the titration volume as representing the final titration point from such calculated values by retrogressive interpolation of the straight line passing through the points of constant voltage difference.

4,165,219

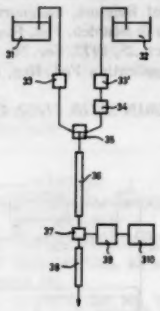
ANALYSIS OF SOLUTIONS USING CHROMATOGRAPHIC COLUMN

Walter Huber, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 27, 1977, Ser. No. 763,137
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604832
Int. Cl.[2] G01N *31/08*
U.S. Cl. 23—230 R 4 Claims

1. A process for analysis of aqueous or non-aqueous liquid solutions which comprises combining a sample of said liquid solutions with a stream of a liquid color reagent and reacting the sample and reagent under pressure as they pass through a

chromatographic column which is filled with particles of inert, finely divided material with particle diameters in the range of



50 to 200 μm, and measuring the liquid reaction product in a photometric detector cell.

4,165,220

PROCESS FOR PRODUCING HARDENED SEMICOKE BRIQUETTES

Angelo Colletta, and Paolo Marini, both of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Continuation-in-part of Ser. No. 817,919, Jul. 21, 1977, abandoned. This application May 22, 1978, Ser. No. 908,470
Claims priority, application Italy, Aug. 4, 1976, 50766 A/76
Int. Cl.[2] C10L *5/16, 5/40*
U.S. Cl. 44—23 **3 Claims**

1. Process for producing hardened semicoke briquettes, comprising forming "green" briquettes by admixing semicoke that has been carbonized at a temperature between about 900° and 1000° C. for 5 to 45 minutes, with pitch as a binder, passing the admixed semicoke and pitch through a rolling operation in which the admixed semicoke and pitch is subjected to a pressure between 2 and 6 tons per centimeter width of the admixed material, and heating the "green" briquettes in a vertical oven at a bed depth of about 5 to 10 meters at a temperature between 300° C. and 400° C. and for a time interval between 35 and 50 minutes.

4,165,221

FORMED CARBON FUEL BRIQUETTES, PROCESS FOR FORMING THE SAME AND PROCESS FOR UTILIZING THE SAME IN THE MANUFACTURE OF STEEL

Nicholas Valenti, Mayfield Heights, Ohio, assignor to Ohio & Penna. Fuels, Inc., Akron, Ohio

Filed Oct. 24, 1978, Ser. No. 954,379
Int. Cl.[2] C10L *5/12, 5/40;* **C21B** *5/00*
U.S. Cl. 44—26 **11 Claims**

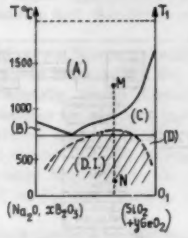
1. A fuel briquette formed from a composition comprising coke breeze, magnesia and an aqueous ammonium polyphosphate solution, said magnesia and aqueous ammonium polyphosphate solution being present in an amount effective to bind said coke breeze into said fuel briquette form.

4,165,222

PROCESS FOR THE MANUFACTURE OF OPTICAL FIBERS WITH A RADIAL REFRACTIVE INDEX

Arnaud de Panafieu; Michel Villard; Christiane Baylac, and Michel Favre, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 14, 1977, Ser. No. 842,218
Claims priority, application France, Dec. 19, 1976, 76 31355
Int. Cl.[2] C03B *37/00;* **C03C** *15/00;* **C03B** *32/00*
U.S. Cl. 65—2 **9 Claims**



1. A process for the manufacture of a glass blank used in the preparation of self-focusing optical fibers having a radial refractive index gradient, wherein said glass blank has a larger diameter than said fibers, from starting oxides which are capable of entering into a glass composition showing the phenomenon of separation into two interconnected and continuous solid phases of different composition, said starting oxides comprising oxides of boron, silicon, sodium and at least one oxide selected from the group consisting of germanium, titanium, phosphorous and aluminum oxides, and said oxides having an impurity level of under 10^{-5} calculated with molar proportions of oxides of transition metals taken into account, and which comprises the stages of

I. Mixing said oxides; followed by melting said oxides into a molten bath;

II. Drawing said glass blank at a rate from said molten bath through a cooling system having a decreasing temperature gradient wherein said rate and temperature gradient are sufficient to cause an incipient phase separation in said glass blank and a radial variation in the chemical composition of each phase as a result of the variation in the rate of cooling between the periphery and the core of the blank due to the passage of said glass blank through said cooling system; followed by thermally annealing said glass blank; and

III. Leaching said glass blank to eliminate most of the impurities; followed by heat consolidating said glass blank.

4,165,223

METHOD OF MAKING DRY OPTICAL WAVEGUIDES

Dale R. Powers, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,927
Int. Cl.[2] C03C *25/00*
U.S. Cl. 65—2 **15 Claims**

1. The method of forming a glass article comprising the steps of

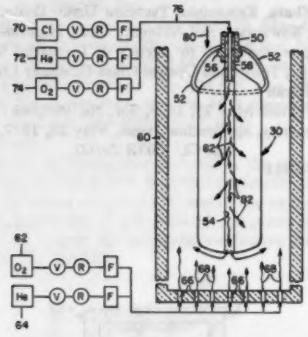
depositing on a starting member a coating of flame hydrolysis-produced glass soot to form a porous soot preform, the refractive index at the inner portion of said preform being greater than that at the outer portion thereof,

removing said starting member to form an aperture in said preform,

disposing said preform in a furnace,

flowing into said aperture a stream of an atmosphere comprising chlorine and oxygen, the concentration of chlorine being between 0.1 vol.% and 9.0 vol.% and the ratio

(vol.% chlorine)^2/(vol.% oxygen) being less than 1.0 vol.%, and



heating said soot preform to a temperature within the consolidation temperature range for a time sufficient to cause said soot particles to fuse and form a dense glass layer.

4,165,224

METHOD OF MANUFACTURING OPTICAL FIBRE PREFORMS

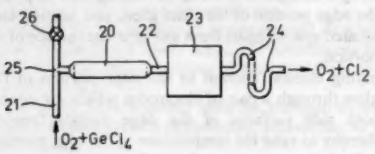
John Irven, Harlow, and Andrew P. Harrison, Stansted, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 888,050

Claims priority, application United Kingdom, Mar. 24, 1977, 12431/77

Int. Cl.^{2} C03B *37/02*; C03C *25/02*

U.S. Cl. 65—3 A **9 Claims**



1. A method of silica optical fiber preform manufacture wherein the material that is to form the core of the preform contains a volatile oxide and is provided as a layer of doped silica lining the bore of a silica tube, wherein the bore of the tube complete with its lining is first shrunk and then finally collapsed by repeatedly traversing a hot zone along the tube while it is rotated about its axis, wherein during said shrinking of the bore a slight overpressure is maintained in the bore by a gas mixture containing oxygen and a halide or oxy-halide of the element having said volatile oxide, passing said mixture halides of the volatile oxide through the tube, then through a reservoir, of a size sufficient to trap soot swept down from the hot zone and to overcome the problem of heat rise within the tube, by acting as a heat sink and finally through an unconstricted long pipe whose rheological conductance is small enough to provide the requisite overpressure within the tube to overcome the tendency for the tube to flatten during the shrinkage of its bore, and wherein the concentration of the halide or oxy-halide in relation to the oxygen is such as to compensate at least in part the volatile oxide loss by volatilization during bore shrinkage.

4,165,225

DISTRIBUTOR FOR OPTICAL SIGNALS

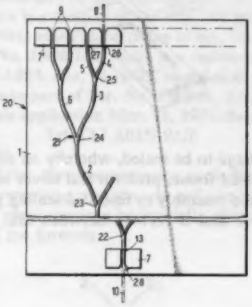
Franz Auracher, Munich, and Ralf Kersten, Rottach-Egern, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 668,698, Mar. 19, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,526

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1975, 2516975

Int. Cl.^{2} C03C *27/00*

U.S. Cl. 65—4 B **4 Claims**



1. A method of forming a distributor of optical signals comprising a substrate, a substantially planar waveguide structure provided on the substrate, said waveguide structure being a metallic hollow guide structure and having a single input end connected by a tree-like branching structure to a plurality of output ends, and means disposed on said substrate adjacent each of said input and output ends for locating an end of an optical fiber at each of the ends, said branching structure having at least one branching point interconnecting a segment of the waveguide structure with two curved branching sections extending therefrom, each of said curved branching sections having a radius of curvature great enough that the guiding of optical signal in the branching section is not impaired, said method comprising providing a substrate with a metallic surface; forming a waveguide structure on a surface of the substrate by applying a layer of light sensitive material on the metallic surface, exposing the light sensitive material through a mask to produce a core of each segment of the waveguide structure, developing the exposed photosensitive layer to leave the cores on the surface, metallizing the surfaces of the cores, and then removing the cores to leave the metallic hollow guide structure; and forming said means for locating on said substrate.

4,165,226

PROCESS FOR PREPARING AN ELEMENT OF A DUAL-IN-LINE CERAMIC PACKAGE PROVIDED WITH A LAYER OF SEALING GLASS

Katsuhiko Kita, Nagoya, Japan, assignor to Narumi China Corporation, Aichi, Japan

Filed Mar. 29, 1978, Ser. No. 891,176

Claims priority, application Japan, Mar. 29, 1977, 52/35836; Aug. 11, 1977, 52/96840

Int. Cl.^{2} C03C *27/00*

U.S. Cl. 65—42 **10 Claims**

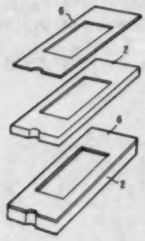
1. In a process for hermetically sealing together the substrate and cover of a ceramic dual-in-line package, the improvement comprising:

(1) forming powdered low-melting sealing glass into a shape corresponding to the peripheral area of said substrate and/or cover,

(2) compressing and sintering said shaped powdered sealing

glass, whereby a solid sintered sealing glass preform is produced,

(3) positioning said preform together with a lead frame between said substrate and cover of said dual-in-line ce-



ramic package to be sealed, whereby an assembly of said substrate, lead frame, preform and cover is produced,

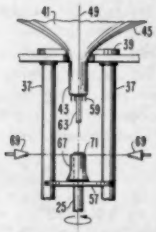
(4) heating said assembly to fuse said sealing glass, whereby an hermetic seal is formed between said substrate and cover.

4,165,227

STEM-SEALING METHOD FOR ASSEMBLING ELECTRON TUBES INCLUDING IMPROVED CULLET COLLECTION

Jawdat I. Nubani, Clarks Summit, and Raymond L. Muenkel, Plains, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,827
Int. Cl.² C03C *27/00*
U.S. Cl. 65—56 **7 Claims**



1. In a method for sealing a glass stem into the glass neck of an electron tube including positioning said glass stem on a mount pin in a desired position in said neck, said neck being longer than desired, heat-sealing said neck to said stem, heat severing the excess glass from said neck, whereby the molten portion of said excess glass attaches itself to said mount pin, and sliding said mount pin away from said stem with said excess glass attached around said mount pin, the additional steps comprising

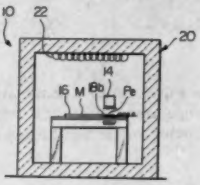
(a) heating said excess glass until it releases from said mount pin without substantially fracturing said excess glass, and then (b) removing said released excess glass from the vicinity of said mount pin without substantially fracturing said glass.

4,165,228

PROCESS AND APPARATUS FOR HEAT TREATING EDGE OF PLATE GLASS

Yoshihiro Ebata, Kawanishi; Tsutomu Ueno, Ikeda; Nagamasa Katsoka, Kawanishi, and Akimasa Akao, Higashi-murayama, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Central Glass Company Limited, Ube, both of, Japan

Filed May 25, 1978, Ser. No. 909,695
Claims priority, application Japan, May 26, 1977, 52-62008
Int. Cl.² C03B *29/00*
U.S. Cl. 65—111 **18 Claims**



1. A process for treating an edge of a flat plate glass, comprising:

heating the whole of the plate glass to a first temperature;

heating only a straight and elongate edge portion of the plate glass including the edge to a second temperature higher than that in the other portion of the plate glass and lower than the softening temperature of the plate glass, said second temperature being higher than said first temperature, said heating the edge portion being carried out by using a straight and elongate heating unit disposed along the edge portion of the plate glass, said heating unit being located spaced apart from and near the surface of the edge portion;

applying electric current to the edge portion of the plate glass through a pair of electrodes which are contacted to both side surfaces of the edge portion, respectively, thereby to raise the temperature in the edge portion to the softening temperature of the plate glass.

7. An apparatus for treating an edge of a flat plate glass, comprising:

supporting means for supporting the plate glass;

first heating means for heating the whole of the supported plate glass to a first temperature;

second heating means for heating only a straight and elongate edge portion of the plate glass including the edge to a second temperature which is higher than that of the other portion of the plate glass and lower than the softening temperature of the plate glass, said second temperature being higher than said first temperature, said second heating means including a straight and elongate heating unit secured to said supporting means along the edge portion of the supported plate glass, said heating unit being located spaced apart from and near the surface of the edge portion;

a pair of electrodes contacted to both side surfaces of the edge portion of the plate glass, respectively, which both side surfaces are opposite to each other, said electrodes being supplied with electric current to raise the temperature in the edge portion to the softening temperature of the plate glass.

4,165,229

HERBICIDAL METHOD

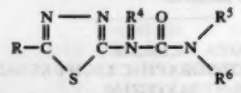
Wendell R. Arnold, Delray Beach, Fla., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 683,872, May 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 533,897, Dec. 18, 1974, Pat. No. 3,972,706, which is a continuation-in-part of Ser. No. 374,598, Jun. 28, 1973, abandoned. This application Aug. 29, 1977, Ser. No. 828,699

Int. Cl.[2] A01N 9/12, 9/00

U.S. Cl. 71—90 8 Claims

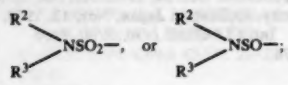
1. A method for killing and preventing the growth of unwanted vegetation on fallow wheatland between the time of harvesting the wheat crop and the time of the next planting of winter or spring wheat which method comprises applying to the locus to be treated an herbicidally-effective amount of a compound of the formula:



(I)

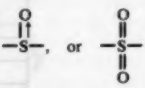
wherein

R is R^1X—,



R^1 is lower alkyl or C_3–C_7 cycloalkyl;

X is —S—,



R^2 is hydrogen or a substituted or unsubstituted lower alkyl, the substituents being selected from the class consisting of halo, hydroxy, cyano, and lower alkoxy;

R^3 is lower alkoxy, lower alkenyl, lower alkynyl, or a substituted or unsubstituted lower alkyl, the substituents being selected from the class consisting of halo, hydroxy, cyano, and lower alkoxy;

R^2 and R^3, when taken together with the nitrogen to which they are attached, form a morpholino, piperidino, or pyrrolidino group;

R^4 is hydrogen or lower alkyl;

R^5 is hydrogen, lower alkyl, lower alkenyl, or C_3–C_7 cycloalkyl;

R^6 is hydrogen, lower alkenyl, C_3–C_7 cycloalkyl, lower alkoxy, or a substituted or unsubstituted lower alkyl, the substituents being selected from the group consisting of halo, hydroxy, cyano, or lower alkoxy, except that R^5 and R^6 cannot both be hydrogen or a C_3–C_7 cycloalkyl; and tautomers of (I) wherein R^4 is hydrogen; and when R^4 is hydrogen, the alkali metal, alkaline earth metal, and ammonium salts thereof.

4,165,230

AGRICULTURAL SPRAY OILS CONTAINING ZINC DIALKYLDITHIOPHOSPHATES

Ralph E. Gravrok, Coral Gables, Fla., and Clarence A. L. Phillips, Ponte-a-Pierre, Trinidad and Tobago, assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,993

Int. Cl.[2] A01N 17/08

U.S. Cl. 71—127 3 Claims

1. An agricultural spray oil composition having a minimum gravity API of 27, a viscosity at 40° C. of between 8 and 20 centi-Stokes and a boiling range of 85° to 775° F. and a minimum unsulfonated residue of 85% and containing from 0.1 to 0.25 weight volume percent thereof of at least one zinc dialkyl dithiophosphate wherein the alkyl groups have from 3 to 8 carbon atoms per molecule.

4,165,231

2,6-DINITROANILINE HERBICIDES

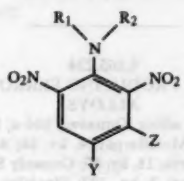
Albert W. Lutz, Princeton, and Robert E. Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 639,729, Dec. 11, 1975, abandoned, which is a division of Ser. No. 538,980, Jan. 6, 1975, Pat. No. 4,066,441, which is a division of Ser. No. 323,000, Jan. 12, 1973, Pat. No. 3,920,742, which is a continuation-in-part of Ser. No. 262,807, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,938, Aug. 25, 1971, abandoned. This application Mar. 11, 1977, Ser. No. 777,271

Int. Cl.[2] A01N 9/20

U.S. Cl. 71—121 61 Claims

1. A method for the preemergence control of undesirable plant species comprising applying to soil containing seeds of the undesirable plant species a herbicidally effective amount of a compound of the formula:



wherein:

Y is halogen, alkyl C_1–C_4, alkenyl C_2–C_4, or CF_3;

Z is alkyl C_1–C_4, alkenyl C_2–C_4 or monosubstituted alkyl C_1–C_4 where the substituent is halogen, alkoxy C_1–C_4 or $-NR_3R_4$;

R_1 is hydrogen, alkyl C_1–C_6, alkenyl C_2–C_6 or alkynyl C_2–C_6;

R_2 is alkyl C_2–C_7 (straight, branched or cyclo), alkenyl C_2–C_6, alkynyl C_2–C_6, or monosubstituted alkyl C_1–C_4 where the substituent is halogen or alkoxy C_1–C_4; and

R_3 and R_4 each represent hydrogen or alkyl C_1–C_4; with the proviso that when Y and Z are methyl and R_1 is hydrogen or ethyl, then R_2 cannot be ethyl; and that when R_1 is hydrogen and Y and Z are methyl, R_2 cannot be 1-ethylbutyl, 1-ethylpropyl, 1-methylbutyl or 1-methylpropyl.

4,165,232

MANUFACTURE OF FERROMAGNETIC METAL PARTICLES ESSENTIALLY CONSISTING OF IRON

Christof Jaeckh, Heidelberg; Werner Steck, Mutterstadt; Rudolf Brodt, Hirschberg; Manfred Ohlinger, Frankenthal; Werner Loeser, Ludwigshafen, and Eberhard Koester, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 15, 1978, Ser. No. 942,656

Int. Cl.[2] C22C 1/04

U.S. Cl. 75—0.5 AA 2 Claims

1. A method of preparing acicular ferromagnetic metal particles consisting essentially of iron and suitable for magnetic recording, said particles being modified at the surface with 0.02 to 0.6% by weight of boron as borate, by reducing a finely divided acicular iron compound selected from the group consisting of iron oxide and iron oxide hydrate with a gaseous reducing agent at a temperature of from 250° to 500° C., wherein there are deposited on said iron oxide or iron oxide hydrate, prior to reduction, a substance selected from the group consisting of oxyacids of boron and their inorganic salts

in such an amount that 0.01 to 1% by weight of boron is present.

4,165,233

TREATING MOLTEN METALLURGICAL SLAG

Francis Gagneraud, 6 Avenue des Tilleuls, Paris, France (75016)

Filed Jul. 12, 1977, Ser. No. 815,029
Claims priority, application France, Dec. 17, 1976, 76 38039
Int. Cl.[2] C21B *3/04*
U.S. Cl. 75—24 **11 Claims**

1. A process for treating metallurgical slags and cinders to modify their physical-chemical characteristics while conserving energy consumption, and to increase their fragmentability and crushability, consisting essentially of:

injecting into the slag a pulverulent mixture of carbonate products, which release non-polluting gases into the slag by endothermal reaction utilizing a part of the sensible heat of the molten mass of the slag, and free carbon products, said injecting taking place while the slag is at a temperature sufficiently low to permit the capture of the gases being evolved while the slag is solidifying, without creating substantial foaming, but still high enough to permit the endothermal reaction to take place, thus creating a porous solid.

4,165,234

PROCESS FOR PRODUCING FERROVANADIUM ALLOYS

Boris M. Kostyanoi, ulitsa Kutuzova, 104-a, kv. 39; Anatoly I. Manokhin, ulitsa Metallurgov, 4, kv. 44; Alexei G. Zubarev, ulitsa Pervomaiskaya, 11, kv. 50; Gennady S. Kolganov, ulitsa Kalinina, 26, korpus 2, kv. 307; Stanislav S. Volkov, ulitsa Volodarskogo, 78, korpus 1, kv. 116; Igor A. Taldykin, Dovatora, 12, kv. 2; Viktor V. Kazansky, 2 prospekt Metallurgov, 5, kv. 29, and Evgeny N. Ivashina, ulitsa Kirova, 18/141, kv. 42, all of Tula, U.S.S.R.

Filed Mar. 14, 1978, Ser. No. 886,923
Int. Cl.[2] C22C *33/00, 33/04*
U.S. Cl. 75—60 **1 Claim**

1. Method of producing ferrovanadium alloys, which comprises melting a charge of ferrovanadium slag, which charge contains iron and vanadium, substantially completely reducing said iron and vanadium to form a metal melt, blowing oxygen into said metal melt in a converter bottom at a rate of supply of oxygen and for a period sufficient to obtain a slag with a content of vanadium pentoxide of at least 35% by weight and a remaining metal melt, discharging the thus remaining metal melt from the converter, and reducing the vanadium and iron in the remaining slag by metal-thermal reduction to form a ferrovanadium alloy.

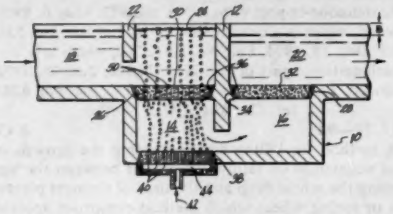
4,165,235

METHOD FOR INLINE DEGASSING AND FILTRATION OF MOLTEN METAL

Jonathan A. Dantzig, New Haven, and Derek E. Tyler, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 26, 1978, Ser. No. 900,065
Int. Cl.[2] C22B *9/02*
U.S. Cl. 75—93 E **21 Claims**

1. A method for the filtration and degassing of molten metal by passing said molten metal through at least one filter-type medium and purging said molten metal with a fluxing gas by passing said fluxing gas through said molten metal in countercurrent flow therewith, the improvement comprising positioning fluxing gas inlet means such that fluxing gas issuing from said fluxing gas inlet means passes through said at least one filter-type medium and providing said at least one filter-type medium with a preferential path for passing said fluxing gas through said at least one filter-type medium wherein said preferential path is substantially larger than the pore size of said at least one filter-type medium.

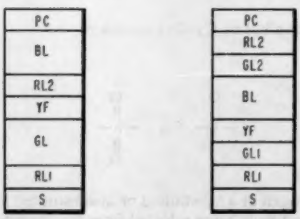


4,165,236

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yasuo Aotsuka, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 523,176, Nov. 12, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,654
Claims priority, application Japan, Nov. 12, 1973, 48/127083
Int. Cl.[2] G03C *1/76, 7/00, 7/04*
U.S. Cl. 96—74 **11 Claims**



1. A color photographic light-sensitive material comprising a support having coated on one surface thereof at least a first red-sensitized cyan-forming silver halide emulsion layer, at least a green sensitized magenta-forming silver halide emulsion layer, a first yellow filter layer, at least a blue-sensitive silver halide emulsion layer and an uppermost protective layer which optionally functions as a second yellow filter layer which contributes not more than 50 percent of the total yellow filter density, in this order from the support, and a second red-sensitized cyan-forming silver halide emulsion layer which is positioned between the first yellow filter layer and the blue-sensitive silver halide emulsion layer, where the sensitivity of the second red-sensitized silver halide emulsion layer is about 0.1 to 0.2 times the sensitivity of the first red-sensitized silver halide emulsion layer.

4,165,237

SILVER HALIDE LIGHT-SENSITIVE MATERIAL

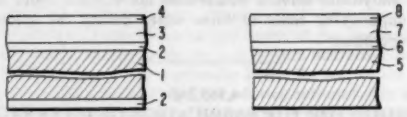
Keisuke Shiba, Shizuoka; Tatsuya Tajima, Minami-ashigara, and Hirokazu Sakaki, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 17, 1976, Ser. No. 687,424
Claims priority, application Japan, May 16, 1975, 50/59025
Int. Cl.[2] G03C *1/48, 1/84, 5/54*
U.S. Cl. 96—76 R **15 Claims**

1. A silver halide light-sensitive material in which a silver halide light-sensitive emulsion layer containing a binder in an amount of about 150 to about 700 g per 1 mol of silver halide is provided at a silver coverage of about 3.7 to about 20 millimol/1 m^2 on a support having a permanent spectral reflec-

tance of about 25% or less in the light-sensitive wavelength region of the silver halide light-sensitive emulsion layer.

11. The silver halide light-sensitive material of claim 1, in combination with an image receiving element for use in diffu-



sion transfer, wherein upon contact with a water soluble silver complex forming agent following exposure silver halide which has not been exposed forms a water soluble silver complex which transfers to said image receiving element.

4,165,238

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE PYRIDYLAZONAPHTHOL DYE-RELEASING COMPOUNDS

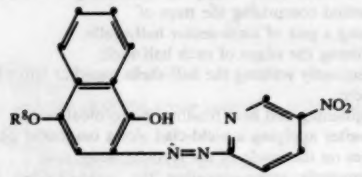
Richard B. Anderson; Elaine H. Hoffmeister, and Richard A. Landholm, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 832,499, Sep. 12, 1977. This application Jul. 24, 1978, Ser. No. 927,190

Int. Cl.[2] G03C *1/84;* C09B *45/00, 29/22, 29/36*

U.S. Cl. 96—119 R 19 Claims

19. A photographic element comprising a support having thereon a coordination complex of a polyvalent metal ion and a compound having the following formula:



wherein:

R^8 is an alkyl or substituted alkyl group of 1 to about 8 carbon atoms.

4,165,239

PROCESS FOR DISPERSING PIGMENTS AND FILLERS USING CARBOXYLIC ACID ESTERS OF TERTIARY ALKYLOLAMINES

Heinrich Linden, and Hans Bornmann, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 916,924

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728237

Int. Cl.[2] C09C *1/24, 1/36, 3/08*

U.S. Cl. 106—300 10 Claims

1. In a process for treating titanium dioxide pigments and iron oxide pigments with a dispersing agent in order to improve their dispersibility in organic and aqueous media, the improvement comprising utilizing at least one ester of at least two moles of an aliphatic carboxylic acid having 6 to 18 carbon atoms in the molecule and selected from the group consisting of alkanoic acids, alkenoic acids, hydroxy substituted alkanoic acids and hydroxy substituted alkenoic acids with a mole of a tertiary alkylolamine selected from the group consisting of triethanolamine and an N-methyl-diethanolamine as the dispersing agent.

4,165,240

STARCH HYDROLYSATE HAVING LESS THAN 5 PPM OF HEAVY METALS

Shigehiro Enokizono, Ageo; Norio Kamata, Funabashi, and Sumiko Kanno, Sakado, all of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 618,090, Sep. 30, 1975, Pat. No. 4,100,025. This application Apr. 21, 1978, Ser. No. 898,585

Claims priority, application Japan, Oct. 4, 1974, 49-113998

Int. Cl.[2] C13K *1/08, 1/06, 11/00*

U.S. Cl. 127—29 2 Claims

1. A starch hydrolysate containing less than five parts per million of total heavy metals.

4,165,241

SOLAR CELL WITH IMPROVED PRINTED CONTACT AND METHOD OF MAKING THE SAME

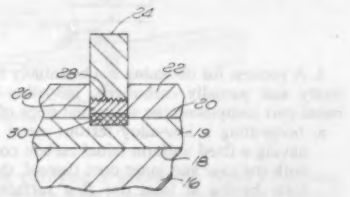
John W. Yerkes, Granada Hills, and James E. Avery, Burbank, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 804,688, Jun. 8, 1977, Pat. No. 4,105,471. This application Mar. 27, 1978, Ser. No. 890,167

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 CC 11 Claims



9. A silicon solar cell comprising:

(A) a silicon semiconductor body including first and second surfaces with a P/N junction therebetween at a shallow depth from said first surface of less than approximately 0.5 microns and an ohmic contact pattern on said second surface of said body opposite said first surface;

(B) an electrically conductive contact pattern on said first surface;

(C) a tungsten dioxide antireflective coating on said first surface and coextensive therewith except under said contact pattern; and

(D) a layer of tungsten under said contact pattern and forming a bond and an electrical connection with said contact pattern and with said first surface; the combination of said layer and said coating being continuous.

4,165,242

TREATMENT OF METAL PARTS TO PROVIDE RUST-INHIBITING COATINGS BY PHOSPHATING AND ELECTROPHORETICALLY DEPOSITING A SICCATIVE ORGANIC COATING

Roger A. Kelly, Euclid, and Howard G. Pekar, Mentor, both of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed Nov. 21, 1977, Ser. No. 853,238

Int. Cl.[2] C23F *7/10;* C25D *13/06, 13/20*

U.S. Cl. 148—6.15 Z 21 Claims

1. A method of treating metal parts to provide a durable rust-inhibiting coating comprising the steps of

(a) phosphating the metal parts with an aqueous metal phosphating solution,

(b) electrophoretically depositing a siccative organic coating

on the phosphated metal parts contained in a rotatable porous barrel, and

(c) applying a corrosion inhibiting film of oil as a seal coat.

4,165,243

METHOD OF MAKING SELECTIVELY CARBURIZED FORGED POWDER METAL PARTS

Myron C. Sarnes, Northville, and Ramjee Pathak, Canton, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed May 31, 1978, Ser. No. 911,024

Int. Cl.[2] C21D *1/48*

U.S. Cl. 148—16.5 **12 Claims**

1. A process for obtaining a substantially fully dense, selectively and partially carburized, low-alloy ferrous, powder metal part comprising the sequential steps of:

a. briquetting a low-alloy ferrous metal powder preform having a fixed uniform initial carbon content throughout both the case and inner core thereof, the briquetted preform having at least one first surface portion thereof which in the final forged form is required to be of a certain case depth and having at least a second surface portion which in final forged form is to be substantially uncarburized,

b. sealing said at least one second surface portion from the carburizing atmosphere by applying masking means substantially completely enclosing in sealing engagement said at least one second surface portion, said masking means comprising a metal member having surfaces which interfittingly engage said preform to isolate selected regions thereof from its surroundings,

c. sintering said preform,

d. carburizing said preform to substantially increase the initial carbon content thereof in said case by providing a controlled carbon atmosphere of rich endothermic gas and maintaining said preform in said controlled atmosphere for a predetermined period of time sufficient to obtain a desired case depth of final carbon content at said at least one first surface portion substantially greater than said initial carbon content of the case as well as the final carbon content of said inner core and said at least one second surface portion,

e. removing said masking means from said preform, and

f. forging said preform.

4,165,244

SOLDERING FLUX AND METHOD OF USING SAME

Norman L. Jacobs, 3102 Milam St., Houston, Tex. 77006

Filed Oct. 21, 1977, Ser. No. 844,224

Int. Cl.[2] B23K *35/34*

U.S. Cl. 148—23 **8 Claims**

1. A soldering flux, consisting essentially of:

an acid anhydride having a molecular weight of less that about 800 which does not produce water during soldering, selected from the group consisting of (a) carboxylic acid anhydrides having at least nine carbon atoms, and (b) cyclic and substituted cyclic acid anhydrides and derivatives thereof wherein the ratio of the total number of carbonyl groups to carbon atoms is no greater that 1:4;

a catalyst to promote the opening of the anhydride during soldering; and

an anhydrous solvent which does not contain water as an impurity or react to form water during the soldering operation.

4,165,245

METHOD FOR THE FABRICATION OF INTERNALLY WELD-CLADDED PIPE ELBOWS

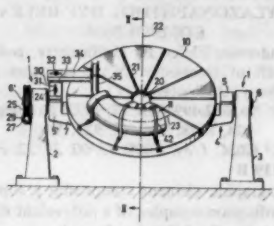
Alfred Ludwig, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 28, 1977, Ser. No. 865,155

Claims priority, application Switzerland, Jan. 10, 1977, 238/77

Int. Cl.[2] C21D *1/00*

U.S. Cl. 148—127 **2 Claims**



1. A method of internally weld-cladding a toroidal body, said method comprising the steps of

forming a pair of torus-sector half-shells;

machining the edges of each half-shell;

subsequently welding the half-shells together into a toroidal body;

straightening and heat treating the toroidal body;

thereafter applying a weld-clad along tangential generatrix lines on the inside of the toroidal body; and

subsequently stress-annealing the weld-cladded toroidal body.

4,165,246

PROCESS FOR THE HEAT TREATMENT OF THICK WALLED STEEL PIPES

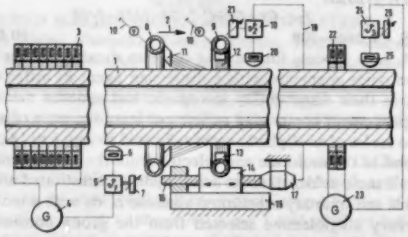
Friedhelm Reinke, Remscheid, and Friedhelm Emde, Hückeswagen, both of Fed. Rep. of Germany, assignors to Aeg-Elotherm, G.m.b.H., Remscheid-Hasten, Fed. Rep. of Germany

Filed Apr. 26, 1977, Ser. No. 790,909

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620377

Int. Cl.[2] C21D *9/08, 9/14*

U.S. Cl. 148—150 **2 Claims**



1. In a process for the heat treatment of thick-walled steel

pipes in transit in their longitudinal direction through heat treatment stations at a predetermined transit speed, in case of which parts of the pipe jacket lying side by side in the direction of the longitudinal axis of the pipe and mutually displaced and in succession, are subjected to the same heat treatment, and in which the pipes are first heated over the entire cross section of the pipe wall, to the austenization temperature of the pipe material, the improvement wherein said pipes are then quenched only in one of the surface layers of the pipe material by supplying a coolant to the surface to form martensite in said one surface layer while martensite is not formed in the not-quenched wall parts, and are finally drawn automatically in the surface layer by the supply of heat stored in said not-quenched parts of the wall from said first heating to austenization temperature step, which not-quenched parts are left to cool to form an interstage structure.

4,165,247

POLYURETHANE SOLID PROPELLANT BINDER

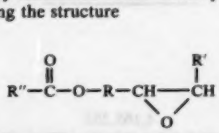
William R. Brew, New York, N.Y., and Raymond M. Price, Applegate, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1966, Ser. No. 526,663
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.4 **16 Claims**

1. A composition capable of being cast and cured into a solid propellant comprising:

(a) an organic compound having as its sole reacting groups two isocyanate groups, and

(b) the hydroxy terminated condensation product of a compound having the structure



wherein

R is alkylene

R′ is selected from the group consisting of hydrogen and alkyl

R″ is alkyl

and a compound having the structure

wherein R‴ and R′ᵛ are selected from the group consisting of hydrogen and alkyl.

4,165,248

METHOD OF JOINING FLUOROCARBON MEMBRANE SHEETS WITH QUATERNARY AMMONIUM COMPOUNDS

William B. Darlington; John D. Driskill, and Donald W. Du Bois, all of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 746,271, Dec. 1, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,754
Int. Cl.² C09J *5/02*
U.S. Cl. 156—308 **8 Claims**

1. A method of bonding first and second permionic membrane sheets fabricated of fluorocarbon polymers having pendant acid groups chosen from the group consisting of sulfonyl groups, carboxylic acid groups, phosphoric groups, phosphonic groups, and derivatives thereof, which method comprises the steps of:

contacting a strip fabricated of fluorocarbon polymers having pendant acid groups chosen from the group consisting of sulfonyl groups, carboxylic acid groups, phosphoric groups, phosphonic groups, and derivatives thereof, with a quaternary ammonium compound chosen from the group consisting of quaternary ammonium hydroxide and quaternary ammonium salts, and having organic constituents chosen from the group consisting of methyl, ethyl, propyl, butyl, pentyl, and amyl groups;

forming a lap of said contacted first sheet, said second sheet, and said strip, the strip being interposed between the first and second sheets; and

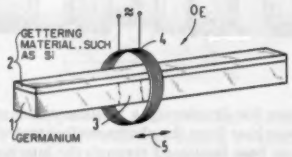
heating said lap to above about 246° C. while imposing an elevated pressure thereon whereby to effect a bond between said first sheet, said strip, and said second sheet.

4,165,249

METHOD OF PURIFYING GERMANIUM BODIES

Walter Heywang, Neukeferloh, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1977, Ser. No. 772,100
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2607911
Int. Cl.² B01J *12/17*
U.S. Cl. 156—605 **13 Claims**



1. A process of purifying a germanium body containing impurities therein which form complex compounds in liquid germanium and tend to sergregate relatively poorly in such liquid germanium, comprising:

applying an extended continuous layer of a relatively pure gettering material which tends to prevent formation of complex impurity compounds onto a surface extending substantially the entire axial length of a germanium body to be purified;

melting and solidifying at least said germanium so that at least some impurities therein are bound to said gettering material and until a desired degree of germanium purity is attained; and

removing at least the layer of gettering material from the so-processed germanium body.

4,165,250

RIBOFLAVIN PURIFICATION

Albert Epstein, Edison; Glen Graham, Rocky Hill, and William A. Sklarz, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 669,139, Mar. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 609,132, Aug. 29, 1975, abandoned. This application Nov. 14, 1977, Ser. No. 850,991
Int. Cl.² C12D *5/04*
U.S. Cl. 435—267 **6 Claims**

1. A process for the recovery of purified riboflavin from a riboflavin and cell containing fermentation broth comprising:

heating the broth when the fermentation yield is at about the maximum to from about 50° to about 65° C. for from about 15 to about 45 minutes to lyse the cells and decrease beoth viscosity,

adding to the heated fermentation broth a volume of water insufficient to dissolve suspended solids in said broth but sufficient to optimize separation by both diluting previ-

ously dissolved solids and permitting centrifugal separation of solid suspended particles having a density less than that of crystalline riboflavin,

then centrifuging the treated fermentation broth containing the added quantity of water to produce a sludge,

resuspending the sludge with a quantity of water insufficient to dissolve suspended solids but sufficient to optimize separation of solid particles having a density less than that of crystalline riboflavin,

and centrifuging the resuspended sludge to obtain a purified riboflavin-containing centrifugate usable as such as an animal feed supplement.

4,165,251

STRIPPING AND DEVELOPING DEVICE

Nobuo Matsumoto; Osami Tsuji; Yukio Kamiya, and Etsuo Shiozawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 22, 1977, Ser. No. 853,956

Claims priority, application Japan, Nov. 22, 1976, 51-140962; Dec. 17, 1976, 51-151639

Int. Cl.[2] B32B *31/00*; G03B *17/50*; G03D *9/02*

U.S. Cl. 156—584 **5 Claims**

1. In a device for developing a photosensitive material by stripping a cover base from the photosensitive material consisting of the cover base laminated through the intermediary of a photosensitive layer to a support member, said stripping and developing device comprising:

a stripping roller consisting of the combination of a plurality of cover-base separating rollers and a plurality of brush rollers larger in diameter than said separating rollers, said separating rollers and said brush rollers being arranged alternately in side by side relation; and

a plurality of nip rollers contacting said separating rollers, said stripping roller being rotated in a direction opposite to the direction of transportation of the photosensitive material, with said brush rollers contacting the cover base surface of the photosensitive material, said brush rollers stripping the cover base at the leading end of the photosensitive material from said support member, and the cover base thus separated being held for transportation between said separating rollers and said nip rollers, whereby the cover base is completely separated from the support member.

4,165,252

METHOD FOR CHEMICALLY TREATING A SINGLE SIDE OF A WORKPIECE

Stephen R. Gibbs, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 718,897, Aug. 30, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,747

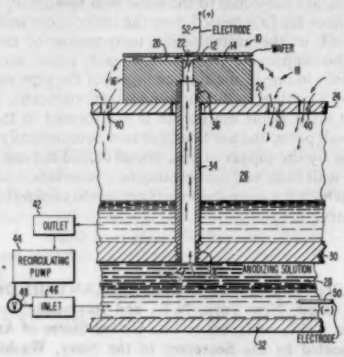
Int. Cl.[2] H01L *21/312*; C23F *1/02*

U.S. Cl. 156—655 **6 Claims**

1. A method of chemically treating a workpiece on one surface only comprising the steps of:

placing the workpiece with a surface to be treated horizontally down on a horizontally disposed top surface of a table, said top surface having a centrally located aperture thereon and the workpiece and top surface being coextensive:

introducing liquid chemical in an upward direction through the aperture and across the top surface where said chemical flows between the top surface and the entire surface to be treated with sufficient pressure to space the workpiece from the top surface so that liquid chemical performs the treatment on the entire surface of the workpiece and at the same time utilizing said introduced fluid to alone maintain orientation of the workpiece relative to the top surface during this treatment.



4,165,253

PROCESS FOR PRODUCING PULP

Mikhail A. Ivanov, Severny prospekt, 73, korpus 3, kv. 51; Vladimir G. Ushakov, Grazhdansky prospekt 104, korpus 1, kv. 210; Vitaly M. Krjukov, ulitsa Novosibirskaya, 21, kv. 13; Viktor I. Losik, Kondratievsky prospekt, 79, kv. 159; Vasily I. Sorokin, prospekt Morisa Toreza, 104, korpus 3, kv. 41, all of Leningrad; Avgust V. Osipov, Leninsky prospekt, 52, kv. 265, Moscow; Valery S. Gromov, ulitsa Gorkogo, 27/29, kv. 38; Jury S. Khrol, ulitsa Daugavgrivas, 13, kv. 4, both of Riga; Galina G. Bakina, Zavodskoi pereulok, 11, Lomonosov Leningradskoi oblasti; Semen I. Andabursky, ulitsa Lenina, 399, kv. 43, Riga; Valery G. Kenin, prospekt Junogo Lenintsa, 75, kv. 8, Lomonosov Leningradskoi oblasti; Tatyana K. Vasilevskaya, Izmailovsky prospekt, 12, kv. 11; Ljudmila I. Stolyarova, ulitsa Dvinskaya, 9, kv. 16, both of Leningrad, and Ella J. Beizer, ulitsa Zverinskaya, 17-b, kv. 25, Leningrad, all of U.S.S.R.

Filed Jul. 20, 1978, Ser. No. 927,592

Int. Cl.[2] D21C *3/16*

U.S. Cl. 162—19 **4 Claims**

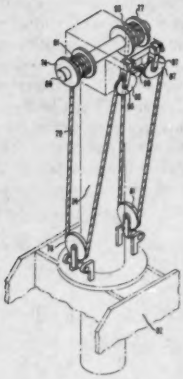
1. A process for producing pulp from a vegetable stock consisting in the subsequent steps of treating the vegetable stock with water at a temperature within the range of from 110° to 170° C. under a pressure of from 2 to 7 atm.g. for a period of from 0.3 to 4 hours at a weight ratio of the vegetable stock to water of 1:2–4 respectively; simultaneously impregnating and cooking said water treated vegetable stock in a solution of nitric acid at a temperature of from 70° to 90° C. for a period of from 0.5 to 3 hours; continuing said cooking at a temperature of from 100° to 130° C. under a pressure of from 1 to 4 atm.g. for 0.3–0.5 hour; extracting the cooked vegetable stock with alkali; decontaminating the gaseous cooking products by mixing said gaseous cooking products with air in a volumetric ratio of 1:0.5–1 respectively and passing the mixture of gaseous cooking products and air through the spent liquor resulting from the alkali extraction stage.

4,165,254

PULLEY SYSTEM INCLUDING EMERGENCY LOCKING MEANS FOR NUCLEAR REACTOR VESSEL INSPECTION APPARATUS

Renato D. Reyes, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,390
Int. Cl.[2] G21C 17/00
U.S. Cl. 176—19 R 3 Claims



1. Apparatus for inspecting a nuclear reactor vessel; the vessel having an external flange and a plurality of guide studs thereon and extending upwardly therefrom defining a generally circular path; an internal circumferential vessel flange; an internal locating element disposed on said internal circumferential vessel flange the exact position of which is known; a support ring generally sized to relate to the path defined by the position of said guide studs; a plurality of guide stud bushings, equal in quantity to the number of said guide studs, said bushings being larger in internal diameter than the outer diameter of said guide studs; first clamping means for movably mounting said bushings on said support ring to enable, when loosened, alignment of each of said bushings with one of said guide studs; at least three support legs, all but one of said support legs including means for adapting said legs to contact and rest upon said internal circumferential vessel flange, the remaining support leg including means for adapting said leg to engage said internal locating element; a central column; a manipulator arm attached to said central column; and a mechanism for equalizing the forces applied to the manipulator arm, the forces causing vertical movement of the manipulator arm along said central column, said mechanism comprising:

(a) drive pulley means, including take-up spools, adapted to be driven thereby, for causing a pulley cable to be displaced relative thereto and disposed adjacent to said central column and above the manipulator arm;

(b) a first set of idler pulley means for accepting a first portion of the pulley cable from said drive pulley means, said first set of idler pulley means being secured to the manipulator arm; and

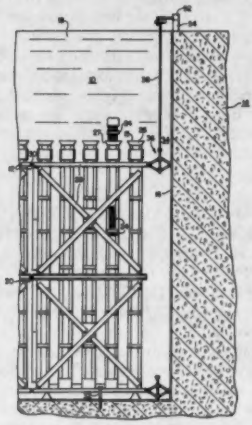
(c) a second set of idler pulley means for accepting a second portion of the pulley cable to define a loop for equalizing any imbalance of forces in the pulley cable, said second set of idler pulley means being secured adjacent to said central column and above the manipulator arm.

4,165,255

NUCLEAR FUEL RACK LATERAL SUPPORT AND PRELOAD DEVICE

Charles B. Knight, deceased, late of Gulf Breeze, Fla. (by June S. Knight, personal representative), assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 22, 1977, Ser. No. 789,912
Int. Cl.[2] G21C 19/20, 19/00; B66F 3/22, 3/00
U.S. Cl. 176—30 6 Claims



1. A lateral support and preload device for a nuclear fuel rack affixed within an enclosure having a vertical wall, said device comprising:

a. a load pad;

b. means for moving said pad predominantly horizontally and into contact with said vertical wall in response to an applied force;

c. shock absorbing means for applying a preload to said pad subsequent to contact of said pad with said vertical wall in response to a further applied force, said shock absorbing means being of a material free from substantial degradation in the nuclear fuel rack environment; and

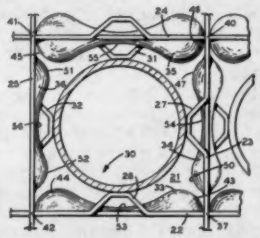
d. means for mounting said horizontal moving means to said rack.

4,165,256

FUEL ELEMENT GRID PLATE WITH CORRUGATION AND BOSSES

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,874
Int. Cl.[2] G21C 3/02
U.S. Cl. 176—78 1 Claim



1. A fuel element grid plate for stabilizing elongated fuel rods having longitudinal axes comprising a generally flat sheet

of metal, said sheet having a midplane transverse to the longitudinal axes and a pair of generally parallel edges also transverse to the longitudinal axes, at least one boss on the sheet protruding from the surface thereof in order to engage the surface of one of the fuel rods, and at least one corrugation disposed in a direction that is generally parallel to the transverse midplane, said corrugation formed in the surface of the sheet and spaced from the boss, said corrugation being generally parallel to and intermediate of the transverse edges and protruding from the surface of the sheet over a portion thereof a distance that is less than the boss protrusion in order to space the corrugation from the fuel rod surface, said corrugation having bulbous protrusions extending from the surface of the plate at the extremities of the corrugation, and an intermediate corrugation portion connecting the bulbous protrusions, said bulbous protrusion extending from the surface of said plate through distances that are greater than the intermediate corrugation portion.

4,165,257

BIOPOLYMER FILTERABILITY IMPROVEMENT BY CAUSTIC-ENZYME TREATMENT

Olaf M. Stokke, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 13, 1978, Ser. No. 886,021
Int. Cl.[2] C12D *13/04*; E21B *43/22*
U.S. Cl. 435—262 **4 Claims**

1. In an improved hydrocarbon recovery process wherein subterranean petroliferous formations are flooded with aqueous mixtures of biopolymers to increase hydrocarbon recovery, said polymer being treated with enzymes to solubilize cell debris prior to filtration, the improvement comprising treating the polymer, prior to filtration in use in a petroliferous formation with a specific bacillis enzyme at a pH of 12.5 to 13.0 to improve filterability, then filtering prior to use.

4,165,258

PLASMINOGEN ACTIVATING ENZYME-SPECIFIC COMPETITIVE INHIBITOR

E. Kendall Pye, Media; Thomas Maciag; Michael K. Weibel, both of Philadelphia, and Melicote R. Iyengar, Gladwyne, all of Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Oct. 8, 1975, Ser. No. 620,792
Int. Cl.[2] C07G *7/02*; C08C *103/20*; C07C *103/28*
U.S. Cl. 435—215 **28 Claims**

1. A plasminogen activating enzyme-specific competitive inhibitor selected from the group consisting of α-N-benzylsulfonyl-p-aminophenylalanine and its acid derivatives in which the hydroxyl group of its carboxyl group has been replaced by a substituent hydrolyzable to said hydroxyl group.

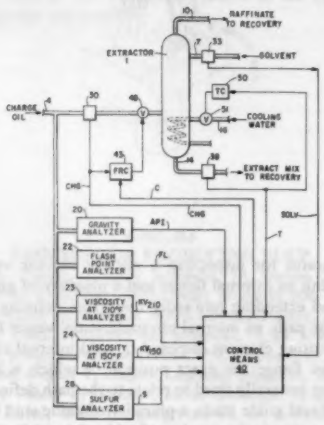
4,165,259

CONTROL SYSTEM FOR A FURFURAL REFINING UNIT RECEIVING HEAVY SOUR CHARGE OIL

Avilino Sequeira, Jr.; John D. Begnaud, and Frank L. Barger, all of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 851,991, Nov. 16, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,617
Int. Cl.[2] C10G *21/00*; G06G *7/58*
U.S. Cl. 196—14.52 **8 Claims**

1. A control system for a furfural refining unit receiving heavy sour charge oil and furfural solvent, one of which is maintained at a fixed flow rate while the flow rate of the other is controlled by the control system, treats the received heavy sour charge oil with the received furfural to yield extract mix and raffinate, comprising gravity analyzer means for sampling the heavy sour charge oil and providing a signal API corresponding to the API gravity of the heavy sour charge oil, flash point analyzer means for sampling the heavy sour charge oil and providing a signal FL corresponding to the flash point temperature of the heavy sour charge oil, viscosity analyzer means for sampling the heavy sour charge oil and providing signals KV_{150} and KV_{210} corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively, sulfur analyzer for sampling the heavy sour charge oil and providing signal S corresponding to the sulfur content of the heavy sour charge oil, flow rate sensing means for sensing the flow rates of the heavy sour charge oil and of the furfural and providing signals CHG and SOLV, corresponding to the heavy sour charge oil flow rate and the furfural flow rate, temperature sensing means sensing the temperature of the extract mix and providing a corresponding signal T, and control means connected to all of the analyzer means, and to the sensing means for controlling the other flow rate of the charge oil and the furfural flow rates in accordance with signals API, FL, KV_{150}, KV_{210}, S, CHG and SOLV; said control means includes VI signal means connected to the viscosity analyzer means for providing a signal VI corresponding to the viscosity index of the heavy sour charge oil in accordance with the kinematic viscosity signals KV_{150} and KV_{210}; SUS_{210} signal means connected to the viscosity analyzer means for providing a signal SUS_{210} corresponding to the heavy sour change oil viscosity in Saybolt Universal Seconds corrected to 210° F.; W signal means connected to the viscosity analyzer means, to the gravity analyzer means and to the sulfur analyzer means for providing a signal W corresponding to the wax content of the heavy sour charge oil in accordance with signals KV_{210}, API and S, A signal means connected to the gravity analyzer means, to the viscosity analyzer means, to the sulfur analyzer means, to the flash point temperature analyzer means and to the VI signal means for providing a signal A corresponding to an interim factor A in accordance with signals KV_{210}, S, API, VI and FL; ΔVI signal means connected to the viscosity analyzer means, to the gravity analyzer means, to the flash point temperature analyzer means, to the VI signal means, the W signal means and the SUS_{210} signal means and receiving voltage VI_{RP} for providing a signal ΔVI corresponding to the change in viscosity index in accordance with signals KV_{210}, API, VI, FL, W and SUS_{210} and voltage VI_{RP}, J signal means receiving direct current voltages corresponding to values of constants C^{84} through C^{87} and being connected to the ΔVI signal means, to the A signal means, to the temperature sensing means for providing a J signal corresponding to a furfural dosage for heavy sour charge oil in accordance with the ΔVI signal, signals A and T, the received voltages and the following equation:



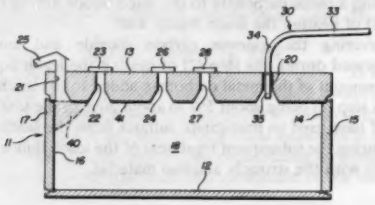
$$J=\{\{-C_{84}(A)+\{[C_{84}(A)]^2-4[C_{85}(A)(T)][-C_{86}+-C_{87}(A)(VI)-\Delta VI]\}^{\frac{1}{2}}\}/2[C_{85}(A)(T)]\}^2$$

4,165,260

PIPELINE CHARGING OF COAL INTO COKE OVEN

Frank H. Bugajski, South Holland, Ill., and Jitendra G. Patel, Munster, Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Dec. 29, 1976, Ser. No. 755,498
Int. Cl.[2] C10B 31/04
U.S. Cl. 201—40 8 Claims



1. A method for charging coal into an elongated coke oven in a battery of coke ovens, said coke oven having longitudinally-spaced first and second ends and a gas-exhaust opening adjacent said first end, said method comprising the steps of:

heating a coke oven to a temperature at which coal volatilizes;

transporting coal particles to said coke oven with steam, as a coal-steam mixture, along an enclosed path including a main enclosed path portion serving other coke ovens in said battery and a branch enclosed path portion between said main path portion and said coke oven;

said transporting step comprising injecting steam at spaced intervals along said main enclosed path portion to convey said coal;

charging said coal into said oven;

exhausting gas from said oven, during said coal charging, only through said gas-exhaust opening adjacent said first end, to create a gas stream in said oven moving toward said gas-exhaust opening;

said coal charging step comprising directing all of said coal-steam mixture downwardly as a single stream through the top of said oven, and spacing said downwardly directed mixture from said second end but closer to said second end than to said first end as the mixture enters the oven, to avoid imparting to said coal particles, by said directing step or by rebounding within said oven, a substantial directional component in the direction of movement of said gas stream toward said gas-exhaust opening;

and avoiding the venting of steam from said mixture in said branch enclosed path portion.

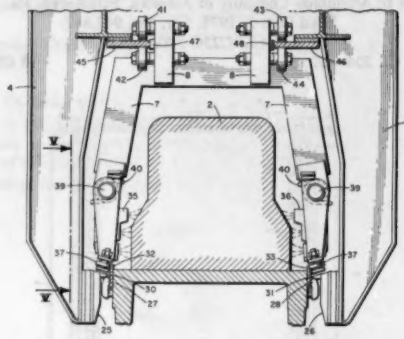
4,165,261

APPARATUS FOR CLEANING A COKE OVEN DOOR

Rauke Henstra; Tonny van der Kley, both of Heerhugowaard, and Johannes N. M. Rens, Velsen-Noord, all of Netherlands, assignors to Hoogovens Ijmuiden, B.V., Ijmuiden, Netherlands

Filed Aug. 23, 1977, Ser. No. 827,076
Claims priority, application Netherlands, Aug. 23, 1976, 7609329
Int. Cl.[2] C10B 43/08
U.S. Cl. 202—241 6 Claims

1. Apparatus for cleaning a coke oven door, which has upper and lower closing surfaces and two side closing surfaces which are to be cleaned, the cleaning apparatus being relatively positionable in a position for cleaning when the door is open, comprising a mobile frame having positioning surfaces engageable with guide surfaces at the said upper, lower and two side surfaces of the door in order to locate the door and apparatus in the cleaning position, said frame including horizontally extending upper and lower guide elements and at least one vertically extending guide element, carriages movable along said guide elements, fluid jets adapted to spray high pressure water carried by said carriages directed in the cleaning position at said closing surfaces, at least two jets on the carriage which moves along the vertically extending guide element being connected by resilient elements to that carriage and there being at least one follower member connected to each jet



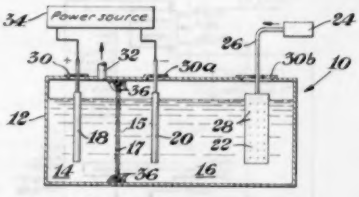
which in use engages and is pressed by the said resilient element against a guide strip on said door so as to maintain each jet in a cleaning position relative to the side closing surfaces being cleaned by each jet.

4,165,262

METHOD OF ELECTROWINNING TITANIUM

Paul R. Juckniess, and David R. Johnson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 722,850, Sep. 13, 1976, Pat. No. 4,118,291, which is a continuation-in-part of Ser. No. 517,569, Oct. 24, 1974, abandoned. This application Aug. 7, 1978, Ser. No. 931,240
The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.
Int. Cl.[2] C25C 3/28, 3/22, 7/04
U.S. Cl. 204—64 T 15 Claims

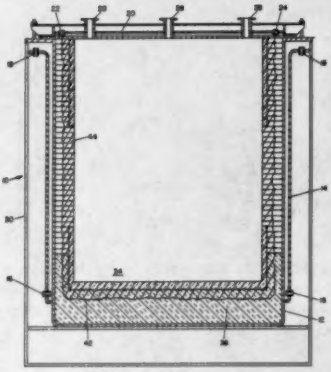


1. A method to produce metallic titanium in an electrolytic cell having an anode, a cathode and a feed means comprising: inserting a foraminous diaphragm with at least a surface portion consisting essentially of cobalt into the cell to space apart an anode compartment from a cathode compartment, the surface portion being of a sufficient size to function as a diaphragm in the cell and having a diaphragm coefficient of greater than zero to about 0.5 and a flow coefficient within the range of from about 0.1 to about 25; introducing an ionizable titanium compound into a molten salt bath contained in the cathode compartment; and impressing an electromotive force between the anode and the cathode to form a gas at the anode and to deposit metallic titanium on the cathode.

4,165,263
METHOD OF PREPARING AN ELECTROLYTIC CELL FOR OPERATION

Donald L. Kinosz, Palestine, Tex.; Charles E. Jennings, Maryville, Tenn., and Stanley C. Jacobs, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 2, 1978, Ser. No. 947,847
Int. Cl.[2] C25C 3/06, 3/08
U.S. Cl. 204—67 5 Claims

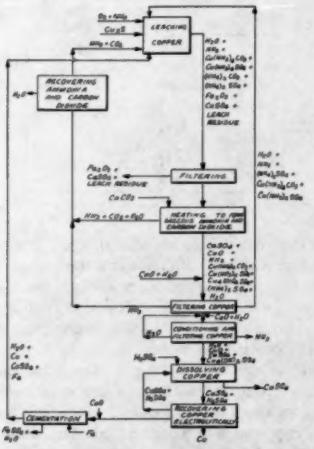


1. A method of preparing for operation a cell having an outer shell and an inner lining, which is employed to produce metal by electrolysis of a compound of the metal in a molten production bath, which comprises placing in the cell an initial bath, having a solidus temperature higher than the solidus temperature of the production bath and higher than the temperature of the inside surface of the shell, for the purpose of establishing a freeze-line barrier for the initial bath within the lining of the cell, and subsequently providing in the cell the production bath.

4,165,264
AMMONIA LEACHING

Donald P. Satchell, Jr., Clifton, Ariz., assignor to Phelps Dodge Corporation, New York, N.Y.

Filed Jun. 14, 1978, Ser. No. 915,176
Int. Cl.[2] C25C 1/12
U.S. Cl. 204—106 7 Claims



1. In a process for obtaining copper from a copper sulfide by the steps of: (1) treating the copper sulfide with oxygen and an aqueous leaching solution of ammonium carbonate, to form a leach liquor containing ammonia complexes of copper sulfate and copper carbonate; (2) heating the leach liquor to form gaseous ammonia and carbon dioxide; (3) treating the leach liquor with a strongly alkaline material to precipitate sulfates and form additional gaseous ammonia; and (4) then recovering copper by electrowinning; the improvement comprising the steps of:

adding a metal carbonate to the leach liquor during the step (2) of heating the leach liquor; and

recovering the gaseous carbon dioxide and ammonia, formed during the step (2) of heating the leach liquor;

the amount of the metal carbonate added to the leach liquor in step (2) being about 5% to about 50% of the total moles of base used to precipitate sulfates from the leach liquor during the subsequent treatment of the leach liquor in step (3) with the strongly alkaline material.

4,165,265
MULTI-STAGE IRRADIATION METHOD OF CURING A PHOTOCURABLE COATING COMPOSITION

Seizi Nakabayashi, Itami; Taizo Matsuura, Hirakata, and Tamio Iimure, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation of Ser. No. 667,031, Mar. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 506,193, Sep. 13, 1974, abandoned. This application Apr. 7, 1978, Ser. No. 894,505
Claims priority, application Japan, Sep. 17, 1973, 48-104726
Int. Cl.[2] C08G 18/00, 63/00
U.S. Cl. 204—159.14 11 Claims

1. In a method of curing a photocurable coating composition by irradiating the composition with actinic radiation therein, said composition containing as the principal component an unsaturated polyester resin, an unsaturated polyurethane resin, an unsaturated acrylic resin, and an unsaturated epoxy resin and a photosensitizer, the improvement wherein the coating composition is irradiated in air in two stages; (1) the first stage, wherein the photocurable coating composition is subjected to actinic radiation with a metal halide lamp emitting wavelengths in the range of about 185 to 500 millimicrons, having a dominant wavelength or wavelengths in the range of 380 to 420 millimicrons and (2) a second stage wherein the photocurable composition is further subjected to another actinic radiation with a medium or high pressure mercury lamp emitting wavelengths in the range of 185 to 500 millimicrons having a dominant wavelength or wavelengths shorter than that in the first stage and falling in the range of from about 360 to 380 millimicrons.

4,165,266
RADIATION CURABLE PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Kenneth C. Stueben, Bridgewater; Raymond G. Azrak, Whitehouse Station, and Michael F. Patrylow, Piscataway, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,957
Int. Cl.[2] C08F 8/00, 261/06
U.S. Cl. 204—159.15 15 Claims

1. A radiation curable pressure sensitive adhesive composition comprising:

(a) from 20 to 70 weight percent of a liquid monoacrylate monomer having an inherent viscosity of less than about 1850 cps. at 25° C.;

(b) from 30 to 80 weight percent of a poly(vinyl alkyl ether) having from 1 to 4 carbon atoms in the alkyl segment and having a reduced viscosity of from 0.1 to 0.8, measured at a concentration of 0.1 gram of resin per 100 ml. of benzene at 20° C.; and

(c) from 0 to 10 weight percent of a photoinitiator.

4,165,267

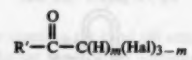
PHOTO-POLYMERIZABLE SYSTEMS CONTAINING 2-HALOACETOPHENONE DERIVATIVES AS PHOTOSENSITIZING AGENTS

Lajos Avar, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

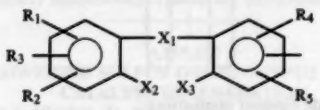
Continuation of Ser. No. 781,309, Mar. 25, 1977, abandoned, which is a continuation of Ser. No. 612,502, Sep. 11, 1975, abandoned. This application Mar. 6, 1973, Ser. No. 884,006
Claims priority, application Switzerland, Sep. 19, 1974, 12728/74

Int. Cl.[2] C08F 8/18, 8/34
U.S. Cl. 204—159.15 15 Claims

1. A photo-polymerizable composition which comprises (a) a photo-polymerizable system comprising at least one reactive unsaturated base prepolymer or long chain monomer in association with at least one unsaturated crosslinking monomer and (b) a photo-sensitizing amount of a compound of the formula



wherein R' is a radical of the formula



aa

wherein X_1 is a direct covalent bond or is —O—, —S—, —SO—, —SO_2— or

and either

X_2 and X_3 are each hydrogen or, when X_1 is a direct covalent bond, X_2 and X_3 together may also form one of the bridge members —O—, —S—, —SO— or —SO_2—,

R_1, R_2, R_4 and R_5 are, independently, hydrogen or alkyl (C_1–C_{18}) with up to 18 carbon atoms in the aggregate of all of the substituents R_1, R_2, R_4 and R_5

R_3 is hydrogen, halogen or a radical

wherein

R_6 is —$C(H)_m(Hal)_{3-m}$, furenyl, thienyl, phenyl or phenyl substituted by 1 alkyl (C_1–C_4) or 1 or 2 halogen substituents,

Hal is chlorine or bromine, and m is 0, 1 or 2,

any substituents on the radical of formula aa being such that the U.V. absorption maximum of the resulting compound lies in the range 250–400 nm.

4,165,268

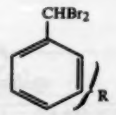
PROCESS FOR THE PRODUCTION OF SUBSTITUTED TOLUENE COMPOUNDS

Franz Marti, Dornach; Tibor Somlo, Birsfelden, and Jacques Gosteli, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

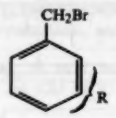
Filed Oct. 31, 1977, Ser. No. 846,876
Claims priority, application Switzerland, Nov. 9, 1976, 14096/76

Int. Cl.[2] B07J 1/10
U.S. Cl. 204—163 R 11 Claims

1. A process for the production of benzal bromides which contain an electrophilic substituent in the ortho- or para-position of the formula (Ia), or of mixtures thereof with the corresponding benzyl bromides of the formula (Ib),



(Ia)



(Ib)

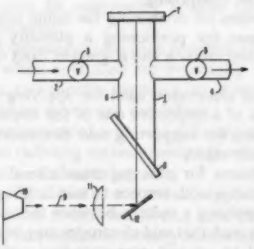
in which R represents an electrophilic substituent in the ortho- or para-position, by treating correspondingly substituted toluenes with elementary bromine under irradiation with visible light in a two-phase system which consists of an aqueous and an organic phase, which process comprises carrying out the reaction in the presence of a base.

4,165,269

METHOD OF MAKING HALOGENATED ACETYLENES

Peter M. Castle, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 5, 1978, Ser. No. 939,554
Int. Cl.[2] B01J 1/10
U.S. Cl. 204—163 R 10 Claims



1. A method of making halogenated acetylenic compounds comprising:

(A) forming a mixture of

(1) a reactant selected from the group consisting of compounds having the general formula R—$C_2H_2X_3$ and R—C_2HX_2, where each X is independently selected from Cl, Br, and I, and R is H or a group which does not undergo a thermal process at an activation energy which is lower than the activation energy for HX elimination from said reactant;

(2) a sensitizer which:

(a) has a higher thermal activation energy for its lowest energy dissociation reaction than does any part of said reactant,

(b) has a collisonal relaxation time less than 500 microseconds,

(c) has an absorbing cross section at the wavelength such that complete absorption occurs at about 20 to about 50 torr and 10 cm path length;

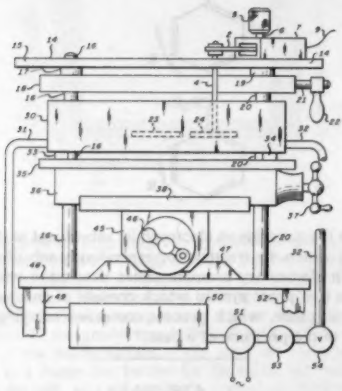
(B) irradiating said mixture with coherent light at said wavelength.

4,165,270

CIRCUIT INTEGRITY TESTER

Robert J. Ost, Great Neck, and Robert F. Perry, Patchogue, both of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sep. 13, 1978, Ser. No. 942,099
Int. Cl.[2] G01N *27/00*; G01R *31/08*
U.S. Cl. 204—195 R **13 Claims**



1. An apparatus for testing continuity of and detecting short circuits of the conductors of a plurality of identical circuit boards wherein the circuit boards are immersed in a liquid solution from which a constituent thereof may be induced to separate onto an electrical conductor immersed therein through the application of a voltage between the conductor and the solution, comprising:

container means for containing the liquid solution,

holding means for positioning a plurality of the circuit boards in the solution and aligned in fixed relation to each other,

a plurality of electrodes, each for applying a voltage to a conductor of a respective one of the circuit boards,

support means for supporting said electrodes in fixed relation to each other,

adjustable means for effecting translational motion of said support means with respect to said holding means, and

means for applying a voltage between the solution and said electrodes such that said electrodes may be simultaneously positioned to contact corresponding conductors of the circuit boards to indicate electrical continuity and to detect short circuits thereof through observation of the separation of the constituent onto the conductors so contacted.

4,165,271

DIAPHRAGMS FOR USE IN THE ELECTROLYSIS OF ALKALI METAL CHLORIDES

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 3, 1977, Ser. No. 838,600
Int. Cl.[2] C25B *1/46, 13/08*
U.S. Cl. 204—252 **30 Claims**

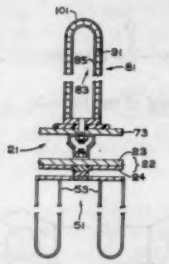
1. In an electrolytic diaphragm cell for the electrolysis of alkali metal chloride brines having an anode assembly containing a plurality of foraminous metal anodes, a cathode assembly containing a plurality of foraminous metal cathodes, a diaphragm covering said cathodes, and a cell body housing said anode assembly and said cathode assembly, the improvement which comprises a porous diaphragm comprising a substantially non-conducting support fabric impregnated with a non-fibrilic active component containing silica, said support fabric having on one side a non-continuous coating of an electroconductive metal selected from the group consisting of nickel, silver, gold, platinum group metals, alloys and mixtures thereof.

4,165,272

HOLLOW CATHODE FOR AN ELECTROLYTIC CELL

Hugh Cunningham, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 27, 1978, Ser. No. 928,646
Int. Cl.[2] C25B *13/02, 11/03, 9/00*
U.S. Cl. 204—282 **16 Claims**



1. A cathode element comprising:

a hollow cathode finger having a pair of electrolyte permeable side walls substantially parallel to and spaced from each other;

said side walls having extensions bonded thereto and extending outwardly therefrom; and

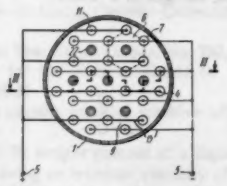
a synthetic separator surrounding said cathode element, spaced from and substantially parallel to the side walls thereof, and resting upon the extensions.

4,165,273

DEVICE FOR PRODUCING DEEPLY DESALTED WATER

Nikolai N. Azarov, Leninsky prospekt, 108, kv. 26; Georgy A. Zelensky, Pionerskaya ulitsa, 29, kv. 2, and Igor V. Borisovsky, Leninsky prospekt, 153, kv. 49, all of Voronezh, U.S.S.R.

Filed Dec. 20, 1977, Ser. No. 864,141
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—301 **2 Claims**



1. A device for producing deeply desalted water, comprising: a dielectric housing; an inlet for the water being treated located in said dielectric housing; an outlet for the water being treated, located in said dielectric housing; electrodes mounted in said dielectric housing adapted to be connected electrically with a current source, the electrodes being rods arranged in

parallel substantially in the vertexes of a regular hexagon, adjacent electrodes in each hexagon having alternating polarity; ion-exchange members located in said dielectric housing and made in the form of tubes; each of said ion-exchange membranes concentrically surrounding and having the same polarity as a corresponding one of said electrodes; desalinization chambers defined by said ion-exchange membranes and by the walls of said dielectric housing communicating with one another; said chambers being substantially filled with ion-exchange resins intended for the sorption of salt ions from the water being treated; brine chambers each of which is defined by a corresponding membrane; said brine chambers being adapted to have water passed therethrough for removing salt ions; and a means for cooling said electrodes.

4,165,274
PROCESS FOR THE PREPARATION OF SYNTHETIC CRUDE OIL

Pieter B. Kwant, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1978, Ser. No. 915,332
Int. Cl.[2] C10G *37/04*
U.S. Cl. 208—93 **2 Claims**

1. A process for treating tar sand oil comprising:
(a) separating the tar sand oil by vacuum distillation into a vacuum distillate and a vacuum residue,
(b) catalytically hydrocracking the vacuum distillate,
(c) separating the vacuum residue by deasphalting into a deasphalted oil and asphalt, and
(d) hydrometallizing the deasphalted oil and thereafter catalytically hydrodesulphurizing the deasphalted oil.

4,165,275
LOWERING SULFUR OXIDE OUTPUT FROM CATALYST REGENERATION

William A. Blanton, Jr., San Anselmo, and Donald W. Blakely, Oakland, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 16, 1977, Ser. No. 861,319
Int. Cl.[2] C10G *11/04*; B01J *21/20*; C01B *17/60*; B01J *29/12*
U.S. Cl. 208—113 **10 Claims**

1. In a fluid catalyst cracking process including the steps of (a) cracking a sulfur-containing hydrocarbon stream in contact with a fluidized bed of a particulate cracking catalyst in a cracking zone at cracking conditions including a temperature in the range from 800° F. to 1300° F., whereby sulfur-containing coke is deposited on said catalyst, and removing a hydrocarbon effluent from said cracking zone, (b) passing catalyst with sulfur-containing coke deposited thereon from said cracking zone and an oxygen-containing gas into a cracking catalyst regeneration zone, burning off said sulfur-containing coke therein at a temperature in the range from 1000° F. to 1500° F. to form a flue gas containing sulfur oxides, and removing said flue gas from said catalyst regeneration zone; and (c) returning the resulting coke-depleted catalyst from said catalyst regeneration zone to contact with said hydrocarbon stream in said cracking zone; the method for decreasing the amount of sulfur oxides in said flue gas which comprises the steps of:
(1) forming at least one sulfur-containing solid material by contacting said sulfur oxide-containing flue gas with a zeoletic crystalline aluminosilicate at a temperature in the range from 1000° F. to 1500° F., at least a majority of ion-exchangeable cationic sites in said aluminosilicate being filled by cations selected from sodium cations and potassium cations, whereby a substantial portion of sulfur in said sulfur oxides combines with said aluminosilicate to form said sulfur-containing solid material and separating the remaining flue gas from said sulfur-containing solid material; and
(2) forming fluid sulfur compounds by contacting said hydrocarbon stream with said sulfur-containing solid material at a temperature in the range from 800° F. to 1300° F.

4,165,276
HYDROCARBON CONVERSION WITH A SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

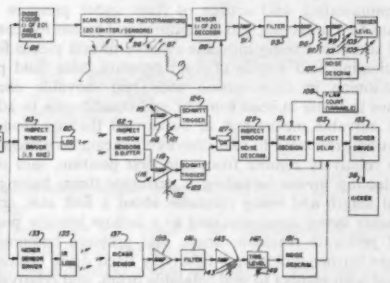
Filed Sep. 14, 1977, Ser. No. 833,332
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 **18 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with a catalytic composite comprising the pyrolyzed reaction product of a catalytically effective amount of a rhenium carbonyl compound with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group metal maintained in the elemental metallic state.

4,165,277
ARTICLE MONITORING AND REJECT APPARATUS

Le Roy F. Frewin, Arvada, Colo., assignor to Inex, Incorporated, Denver, Colo.

Filed Feb. 25, 1977, Ser. No. 771,879
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—3.3 **26 Claims**

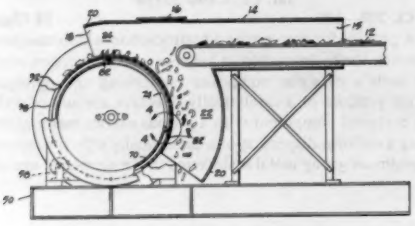


1. An apparatus for monitoring articles for defects, said apparatus comprising:
a plurality of radiating means each of which emits a plurality of pulses when energized for producing radiation at a monitoring area capable for receiving at least a portion of an article to be monitored for defects;
pulsing means connected with said radiating means to cause each of said radiating means to emit a plurality of pulses of radiation at said monitoring area;
radiation sensing means at said monitoring area adjacent to an article when at said monitoring area to be monitored for defects, said radiation sensing means being connected with said pulsing means and responsive to received radiation indicative of a defect in said monitored article producing a plurality of electrical output pulses indicative of said sensed defect;
article presence sensing means for producing an output signal indicative of the sensed presence of an article at said monitoring area; and
signal processing means connected with said radiation sensing means and said article presence sensing means and producing a defect indicating output signal only if a predetermined number of pulses, wherein said number of pulses is greater than one, are received from said radiation sensing means indicative of a sensed fault while article presence is sensed at said monitoring area by said article presence sensing means.

4,165,278
SEPARATOR FOR SHREDDED MATERIALS

Irving Jaffey, 85 Estabrook, San Leandro, Calif. 94577

Filed Oct. 4, 1977, Ser. No. 839,372
Int. Cl.[2] B07B *13/00*
U.S. Cl. 209—45 19 Claims



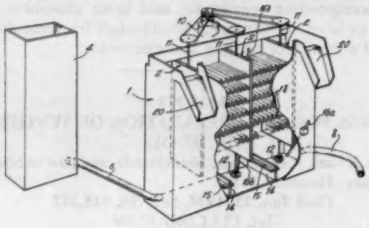
1. A multi-component apparatus for separating the constituents of an admixture of materials comprising, in series: conveying means for conveying said materials from a source thereof to a first point of deposition, material separation means disposed proximate said first point of deposition for receiving said material from said conveying means and for separating out constituents of said admixture in accordance with the relative weights thereof, said separation means including means for directly mechanically contacting said admixture and adhering to a constituent of said admixture, said separation means further including a source of fluid under pressure and means for communicating said source of fluid under pressure to said means for contacting said admixture, said means for contacting said admixture being movable relative to said means for communicating said source of fluid pressure, said fluid pressure functioning in coordination with said movable contacting means to cause at least some of said constituents to adhere to said movable means and to be carried thereby from a first position proximate to said conveying means to a second position relatively remote from said first position, said movable contacting means including a perforate drum having a first axial length and being rotatable about a first axis, said fluid pressure being communicated to a hollow interior portion of said perforate rotatable drum, said pressure communicating means further including a relatively fixed drum coaxially disposed with respect to said rotatable drum, said relatively fixed drum having a cylindrical surface extending 360° about its axis, said relatively fixed drum having a second axial length, the outermost confines of said relatively fixed drum closely proximate to said perforate rotatable drum, said relatively fixed drum including passageway means extending axially along said cylindrical surface for transmitting fluid pressure to said interior of said rotatable perforate drum, said passageway means extending axially along said cylindrical surface a distance less than said second axial length, said seal means between said passageway means and said perforate rotatable drum.

4,165,279
FROTH FLOTATION

Christopher C. Dell, Leeds, England, assignor to National Research Development Corporation, London, England

Filed Dec. 27, 1977, Ser. No. 864,797
Int. Cl.[2] B03D *1/16*
U.S. Cl. 209—169 11 Claims

1. An apparatus for use in froth flotation which comprises:
a receptacle;
at least one upright partition wall defining flotation columns within the receptacle, said at least one upright partition wall comprising at least one pair of vertical partition walls with a spacing provided therebetween;
means for generating bubbles in said receptacle provided below each one of said at least one partition wall including air feed means, at least one vertical rod, an impeller connected to the lower end of said vertical rod, and means for rotatably driving said vertical rod and impeller wherein said vertical rod is disposed within said spacing;
means for dividing each of said flotation columns to provide two or more flotation cells arranged one above the other comprising an upper layer of parallel rods disposed adjacent a lower layer of parallel rods, said upper layer rods being parallel to said lower layer rods;
apertured passage means in said dividing means for the passage of froth upwardly through said dividing means

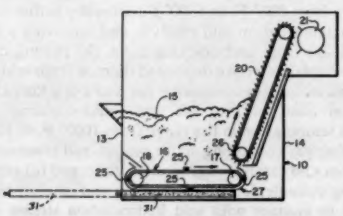


from each lower cell to the adjacent upper cell wherein said means for dividing each of said flotation columns includes control means for each lower cell, said control means being responsive to the changes in thickness of the froth layer in said lower cell and serving to maintain said thickness at a predetermined value and wherein said upper layer rods have a specific gravity of 0.9 to 1.1 and said lower rods have a specific gravity of about 0.5; and
means for providing limited freedom of movement of each of said upper and lower layer rods.

4,165,280
METHOD AND MEANS FOR CLEANING FEED HOPPERS

Jasper B. Holley, Rte. 1, Box 196, Johnston, S.C. 29832

Filed Apr. 12, 1978, Ser. No. 895,570
Int. Cl.[2] B07B *1/04, 1/52*
U.S. Cl. 209—245 4 Claims



1. In a textile fiber feed hopper having a rotatable feed apron with a plurality of outwardly projecting spikes extending upwardly within the hopper and a horizontally movable conveyor in the lower portion of the hopper moving fibers toward the feed apron, the combination of spaced brush means fastened to the conveyor and projecting beyond the conveyor into sequential frictional engagement with spikes on the feed apron whereby spinnable fibers are transferred from said brush means to the feed apron.

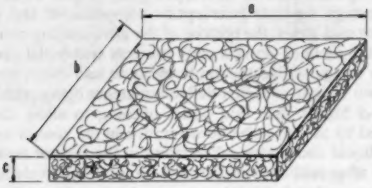
2. A structure according to claim 1 wherein a plate is spaced beneath the conveyor, said plate having a plurality of apertures extending therethrough, and an imperforate end portion extending from the perforate portion of said plate beyond that portion of the conveyor adjacent the feed apron to guide waste beneath the conveyor.

4,165,281

METHOD AND UNIT FOR WASTEWATER TREATMENT BY MICROORGANISMS

Kiyoshi Kuriyama, Kyoto; Munetaka Sato; Tsuneo Matsuzaki, both of Yokohama; Masanori Honma, Yamato, and Seiji Shida, Chigasaki, all of Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1977, Ser. No. 836,921
Claims priority, application Japan, Sep. 24, 1976, 51-114457
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—17 12 Claims



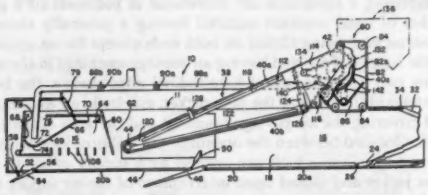
1. A method for wastewater treatment which comprises disposing in an aeration tank at least two non-woven fibrous mats, wherein the fibers are synthetic fibers having a thickness of about 50 to 4,000 denier, having a three dimensional network structure as supporting media having a bulk density of about 0.01 to about 0.40 g/cm^3, wherein said supporting media have a thickness of about 15 to about 30 mm and wherein at least two said supporting media are disposed in parallel to each other at an interval of about 20 to about 100 mm in the aeration tank, causing microorganisms to be retained on the surfaces in the interstices of the non-woven mat, and oxidatively decomposing organic polluting matter in the wastewater using the microorganisms in the presence of oxygen.

4,165,282

OIL RECOVERY METHOD AND APPARATUS

John A. Bennett, West Vancouver; Ian R. McAllister, Vancouver, and Howard Welsh, North Vancouver, all of Canada, assignors to Bennett Pollution Controls Ltd., North Vancouver, Canada

Division of Ser. No. 661,769, Feb. 26, 1976, Pat. No. 4,061,569, and a continuation-in-part of Ser. No. 567,426, Apr. 11, 1975, abandoned, which is a continuation of Ser. No. 464,540, Apr. 26, 1974, abandoned. This application Dec. 5, 1977, Ser. No. 857,513
Int. Cl.[2] F02B *15/04*
U.S. Cl. 210—40 2 Claims



1. A method of collecting oil from a surface of a body of water, said method comprising:

a. moving an oil absorptive belt into contact with an oil polluted surface layer on said body of water to collect oil in said belt from said surface layer,

b. passing said belt over a roll having a curved circumferential contact surface over which the belt is arranged to travel in an arcuate path,

c. engaging the oil absorbing belt with a foraminous squeeze belt having a contact surface which engages the recovery belt along its arcuate path of travel around said roll,

d. moving said squeeze belt along a closed path and engaging said oil recovery belt with adequate pressure to cause oil in the oil absorptive belt to pass from the oil absorptive belt through the squeeze belt, and

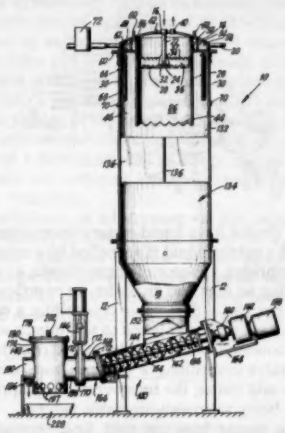
e. collecting the oil removed from the oil absorptive belt.

4,165,283

MULTI-STAGE PURIFICATION SYSTEM

Roland E. Weber, Holyoke, and Carl J. Zimmermann, Ludlow, both of Mass., assignors to Industrial Pollution Control Corp., Ludlow, Mass.

Continuation-in-part of Ser. No. 736,550, Oct. 28, 1976, abandoned, which is a continuation of Ser. No. 411,248, Oct. 31, 1973, abandoned. This application Mar. 29, 1977, Ser. No. 782,435
Int. Cl.[2] B01D *21/26, 29/42*
U.S. Cl. 210—111 19 Claims



1. A multi-stage, single vessel, liquid purification system, comprising:

a tank having an inlet conduit for conveying liquid with solid contaminate into the tank,

a deceleration chamber within said tank for receiving incoming liquid from said inlet conduit which is formed by a cylindrical tube centrally positioned within said tank and which depends from and about said inlet into the central portion thereof, wherein the breadth of said deceleration chamber as formed by said tube is substantially greater than the breadth of said inlet conduit for deceleration of incoming liquid and to allow lighter density solid particles in the contaminate to rise to the top of the liquid within the deceleration chamber for removal and the heavier density solid particles of the contaminate to settle downwardly through the deceleration chamber,

a filter chamber within said tank and about said deceleration chamber which is formed by said tube and outer wall of said tank and within which depends septums for filtering out remaining solids from liquid which passes therethrough and to thereby provide purified liquid,

a terminus at the end of said tube in the central portion of said tank which has a saw tooth configuration that inhibits turbulence of liquid containing solid contaminates as it leaves said tube,

a purified liquid chamber within said tank and above said septums for receiving the purified liquid therefrom having outlet means for removal of the purified liquid from said tank,

a settling chamber with turbulence inhibiter below said deceleration and filtering chambers for forming a static column of liquid which changes direction of liquid flow from said deceleration chamber into said filtering cham-

ber, and in so doing, causing solid particles in the liquid changing direction to settle downwardly, and

compacting means open into the bottom of said tank for receiving solid contaminates from said deceleration and filtering chambers and from said column of static liquid and for compacting said contaminates.

4,165,284

SAFETY DEVICE FOR CHROMATOGRAPHY APPARATUS

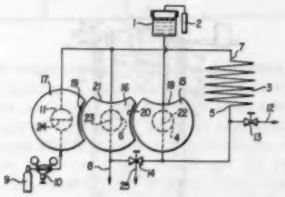
Claude Guillemin, Paris, and Christian Mayen, Creteil, both of France, assignors to Prolabo, Paris, France

Filed Feb. 28, 1978, Ser. No. 881,918

Claims priority, application France, May 2, 1977, 77 13999

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—198 C **8 Claims**



1. A safety device for a liquid-phase chromatography apparatus in which a carrier liquid is propelled by a carrier gas, said apparatus comprising a source of carrier liquid, a carrier liquid reservoir having an inlet and an outlet, an overflow conduit, a source of carrier gas, a first valve controlling a conduit connecting said source of carrier liquid to said inlet, a second valve controlling a conduit from said outlet to said overflow conduit, and a third valve controlling a conduit from said source of carrier gas to said outlet; the improvement comprising:

said valves being separately operable valves;

interlocking means between said first, second and third valves whereby operation of said valves is interdependent and wherein said interlocking means prevents operation of any selected valve when the other two valves are in other than predetermined positions.

4,165,285

COMBINED ANAEROBIC REACTOR AND SETTLER

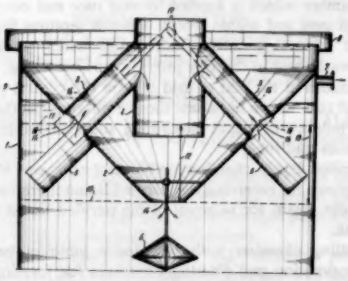
Evert Wind, Houten, and Robbert de Vletter, Huizen, both of Netherlands, assignors to N.V. Centrale Suiker Maatschappij, Amsterdam, Netherlands

Filed Jun. 21, 1977, Ser. No. 808,644

Claims priority, application Netherlands, Jun. 24, 1976, 7606904

Int. Cl.[2] C02C *1/14*

U.S. Cl. 210—195.3 **12 Claims**



1. An installation for the anaerobic purification of a liquid effluent which comprises a reactor tank, an after-settler compartment located in the top part for settling and separating the sludge and liquid, means for introducing the liquid effluent in the reactor tank and means for separating the gases from said sludge and liquid, said after-settler compartment comprising an inlet opening for the mixture of sludge and liquid from the reactor tank and an outlet opening to recycle said sludge and liquid to said reactor tank, said outlet opening being positioned at a level lower than said inlet opening, first deflecting means serving as shield for said inlet opening and second deflecting means for said outlet opening to and from said after-settling compartment respectively positioned in the reactor tank so that the upward flow of developed gases is kept away from said openings, separate interception compartment and outlet means for said gases, the bottom of the after-settling compartment being inclined downwardly towards said outlet opening to allow sludge settled therein to move to said outlet opening by its own weight, said first deflecting means being positioned at a level higher than said outlet opening to allow the gas generated by the anaerobic fermentation in the reactor tank to entrain liquid and sludge while rising in the reactor tank outside the after-settling compartment up to said first deflecting means.

4,165,286

APPARATUS FOR THE INTERMITTENT AERATION OF SEWAGE

August Schreiber, Rahnofstrasse 45, 3001 Hannover-Vinnhorst, Fed. Rep. of Germany, and Siegfried Rudolph, Hannover, Fed. Rep. of Germany, assignors to August Schreiber, Hannover-Vinnhorst, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,760

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701656

Int. Cl.[2] C02C *1/12*; B01F *3/04*

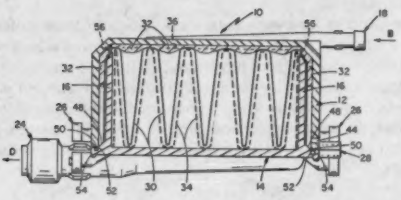
U.S. Cl. 210—220 **11 Claims**

1. An apparatus for the intermittent aeration of sewage comprising a horizontal air distributor in the form of a pipe jacket of bend resistant material having a generally circular cross section, being closed on both ends except for an opening in the supply of air, and having air passage openings in the area in its two opposite lateral longitudinal edges below the horizontal middle plane of the pipe jacket, an elastic air distributor foil covering the air passage openings and the area of the pipe jacket located between the openings, the foil provided with air escape openings which are opened by a supply of air to the pipe jacket and closed upon interruption of the air supply and which is sealed against the pipe jacket outside the area of the air escape openings, and a distancing strip disposed along each of the two opposite lateral longitudinal edges of the pipe jacket, below the air passage openings and between the pipe jacket and the air distributor foil such that each distancing strip together with the section of the air distributor foil extending from the pipe jacket to the distancing strip and with the section of the pipe jacket not covered by the air distributor foil form a space whereby air may enter with little resistance and be distributed the length of the distancing strip and lift the air distributor foil so as to permit air to escape into sewage and whereby upon termination of air supply, the air escape openings of the air distributor foil are closed.

4,165,287
POTTING PLEATED MEMBRANE

Thomas E. Goyne, Denver, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Apr. 4, 1977, Ser. No. 784,364
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—232 12 Claims



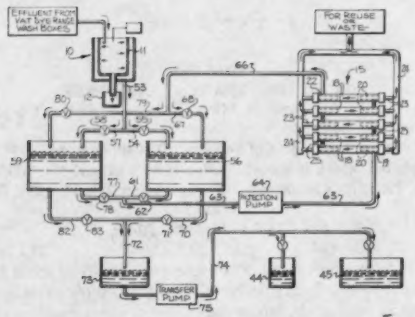
8. In a fluid flow transfer apparatus having a housing, wherein said housing has a central fluid chamber, and a compartment adjacent to said chamber, an inlet and an outlet, a first rib in said central chamber adjacent to said inlet and a second rib in said central chamber adjacent to said outlet, each said rib being between said inlet and outlet, and a pleated membrane positioned within said central chamber, the tips of which membrane on at least one side thereof are bonded to an inner surface in said central chamber of said housing, the improvement comprising:

a plurality of spaced apart ribs on said inner surface of said central chamber of said housing positioned between said first and second ribs and extending from said compartment across said central chamber, whereby said tips are spaced from said surface, and, together with said plurality of ribs and said surface, define a plurality of flow channels for flow of potting material placed in said compartment and flowing therefrom along said surface for bonding said tips to said surface.

4,165,288
PROCESS OF TREATING WASTE WATER FROM A TEXTILE VAT DYEING OPERATION TO PRODUCE A CONCENTRATE FOR REUSE

Richard K. Teed, Greenwood, and Ernest A. Freeman, Jr., Ware Shoals, both of S.C., assignors to Riegel Textile Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,911
Int. Cl.[2] B01D *13/00, 31/00*
U.S. Cl. 210—23 H 4 Claims



1. Process of treating waste water from a textile vat dyeing operation containing water, vat dyes, and dissolved and undissolved impurities normally including salts, lint, foreign matter, etc., to produce a concentrate suitable for reuse in the vat dyeing operation to conserve the use of dyes and water; said process comprising the steps of:

removing undissolved impurities including lint and foreign matter from the vat dye waste water by passing the waste water through a filter having passageways therein of a predetermined size of at least 40 microns for filtering out and removal of undissolved particles of the predetermined size and larger; and

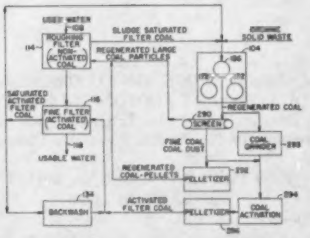
thereafter concentrating the waste water down to a concentrate suitable for reuse in the dyeing operation of a ratio of from about 30/1 to 200/1 by circulating the waste water, at its normal pH of from about 9 to 13 and at pressures from about 400 psig to 1300 psig or higher and at temperatures of from about 130° F. to about 212° F. for creating a turbulent flow of the waste water, through reverse osmosis filtration means including substrate tubes without the normal dynamically formed membranes thereon and having a pore size of from about 0.10 to 0.50 microns, while building up and maintaining a desired amount of build-up on the tubes of a self-formed membrane of the vat dyes in the waste water and filtering and separating of the waste water into a permeate containing excess water and a substantial portion of the remaining impurities including salts and a concentrate containing substantially all of the vat dyes and a desired amount of water, and by removing the permeate and retaining the concentrate for reuse in the dyeing operation;

whereby, utilization of self-formed vat dye membranes eliminates the necessity of lowering the pH of the waste water by costly further treatment because of the adverse affects on normal dynamically formed reverse osmosis membranes, and excessive build-up of the vat dye membranes and the desired filtering and separating action are maintained by the turbulent flow of the waste water in contact with the substrate tubes of the reverse osmosis filtration means.

4,165,289
SYSTEM FOR THE CLARIFICATION OF WASTE WATER AND UTILIZATION OF WASTE PRODUCTS

Adolf H. Borst, Schloss Ramsberg, 7322 Donzdorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 753,402, Dec. 22, 1976. This application Aug. 12, 1977, Ser. No. 824,148
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558703; Jan. 22, 1976, 2602306; Feb. 18, 1976, 2606451; Feb. 18, 1976, 2606452
Int. Cl.[2] C02C *1/18, 5/02*
U.S. Cl. 210—27 23 Claims



19. A process for treating solid and aqueous liquid waste comprising in combination the steps of:

providing at least one upper container, at least one lower container which is proximate but spaced from the container, and a housing enclosing the containers;

providing a first filter and stocking the first filter with non-activated filter coal;

providing a second filter and stocking the second filter with activated filter coal;

flowing the sewage initially through the first filter to remove

therefrom particulate matter entrained in the sewage, whereby the particulate matter adheres to the non-activated filter coal and eventually substantially saturates the coal with particular matter;

flowing an effluent from the first filter through the second filter to remove from the effluent any remaining particulate matter and dissolved pollutants through adsorption by the activated filter coal of the second filter;

discharging usable water from the second filter;

placing solid waste into the lower container, and at least initially heating the lower container so that the solid waste therein reaches a temperature capable of maintaining the incineration of solid waste therein;

flowing into the lower container a limited amount of oxygen so as to sustain the incineration process, liberate heat energy, and generate a first combustible gas while heat liberated in the lower container causes a corresponding heating of gas in the housing and thereby heats the upper container;

periodically removing from the first filter, filter coal saturated with particulate matter;

placing saturated first filter coal into the upper container and maintaining the interior of the upper container substantially oxygen-free, whereby heat energy from the lower container heats the saturated first filter coal in the upper container and causes a degassing and a resulting carbonization of organic matter adhering to the first filter coal to thereby reconstitute the first filter coal and generate additional filter coal and a second combustible gas;

removing from the lower container ash formed therein and removing from the upper container reconstituted and additional filter coal;

discarding the ash and placing reconstituted and additional filter coal in the first filter to replenish saturated filter coal removed therefrom;

collecting the first and second combustible gases and heat treating the gases under a substantial exclusion of oxygen to a sufficient temperature so that relatively long chain hydrocarbons are transformed into relatively short chain hydrocarbons; and

utilizing energy contained in the heat treated gases before their final disposition.

4,165,290

FABRIC CARE COMPOSITION CONTAINING STARCH AND QUATERNARY AMMONIUM COMPOUND

Samuel M. Johnson, and Emelyn L. Hiland, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 13, 1978, Ser. No. 885,937

Int. Cl.[2] D06M *13/36*

U.S. Cl. 252—8.8 **7 Claims**

1. A liquid fabric care composition suitable for restoring body and softness to fabrics comprising:

(a) from about 1% to about 25% of a gelatinized and stabilized vegetable starch prepared by exposing a water dispersion of a gelatinized vegetable starch to a pH of from about 10 to about 13 to stabilize said starch and thereafter neutralizing any excess alkali to provide a pH of from about 4 to about 9;

(b) from about 0.25% to about 10% of a cationic quaternary ammonium antistatic and/or fabric softening agent;

(c) from about 25% to about 98% water.

4,165,291

OVERBASING CALCIUM PETROLEUM SULFONATES IN LUBRICATING OILS EMPLOYING MONOALKYLBENZENE

James T. Gragson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 20, 1978, Ser. No. 917,441

Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*

U.S. Cl. 252—33 **21 Claims**

1. A process for overbasing a calcium petroleum sulfonate containing oil to prepare a lubricating oil additive which comprises dissolving a diluent lubricating oil fraction and a calcium petroleum sulfonate in a monoalkylbenzene solvent and in the presence of a relatively small amount of a low-boiling alcohol, and lime, introducing carbon dioxide into the mixture thus obtained in a gradual manner to obtain a high TBN overbased product.

4,165,292

LUBRICANT CORROSION INHIBITOR

Bryan T. Davis, West Bloomfield, Mich., and Nicholas W. Moat, Toronto, Canada, assignors to Edwin Cooper and Company Limited, Bracknell, England

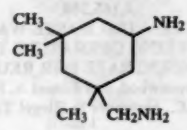
Division of Ser. No. 688,680, May 21, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,165

Claims priority, application United Kingdom, May 23, 1975, 22508/75

Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—51.5 A **13 Claims**

1. A lubricating oil for internal combustion engines comprising a major amount of lubricating oil and a minor corrosion inhibiting amount of a combination of two additives, A and B, wherein A is an oil-soluble basic nitrogen compound selected from the group consisting of tetramethyl-1,3-diaminobutane; bis(benzal aminopropyl)piperazine; benzal aminopropyl dimethylamine; 2-propyl-3-methyl oxazolidine; and a diamine having the formula



and B is an alkyl or alkenyl succinic acid having from 12–22 carbon atoms and said A and B have a weight ratio A/B of 1/2 to 2/1.

4,165,293

SOLID TRANSPARENT CLEANSER

Robert A. Gordon, Jenison, Mich., assignor to Amway Corporation, Ada, Mich.

Continuation-in-part of Ser. No. 797,048, May 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 700,788, Jun. 29, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,548

Int. Cl.[2] C11D *9/26, 9/60, 10/04, 17/00*

U.S. Cl. 252—118 **28 Claims**

1. A transparent soap bar consisting essentially of about 25% to about 55% sodium soap based mainly on tallow or its corresponding fatty acids, where the tallow or corresponding fatty acid soap component alone is at least 25%; about 10% to about 40% of one of an anionic surfactant, an amphoteric surfactant and combinations and complexes thereof; about 15% to about 65% of a two to six carbon dihydric alcohol; said bar being substantially free of monohydric short chain alcohols.

4,165,294

PHENOL-FREE AND CHLORINATED HYDROCARBON-FREE PHOTORESIST STRIPPER COMPRISING SURFACTANT AND HYDROTROPIC AROMATIC SULFONIC ACIDS

John E. Vander Mey, Stirling, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 740,154, Nov. 8, 1976, which is a continuation-in-part of Ser. No. 689,718, May 24, 1976, abandoned, which is a continuation of Ser. No. 601,574, Aug. 1, 1975, abandoned. This application May 22, 1978, Ser. No. 908,189

Int. Cl.[2] C11D *3/43;* B08B *3/08;* C23G *5/02*

U.S. Cl. 252—143 25 Claims

1. A composition for stripping photoresist from an inorganic substrate comprising in combination:

(a) from about 5 to about 60 weight percent of a surfactant alyklarylsulfonic acid having 12–20 carbons;

(b) from about 15 to about 95 weight percent of a hydrotropic aromatic sulfonic acid having 6–9 carbons; and

(c) from 0 to about 40 weight percent of a halogen-free aromatic hydrocarbon solvent with a boiling point above 150° C.;

said composition being free of phenol compounds and chlorinated hydrocarbon compounds and being substantially clear water rinsable.

4,165,295

ORGANIC STRIPPING COMPOSITIONS AND METHOD FOR USING SAME

John E. Vander Mey, Stirling, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 4, 1976, Ser. No. 729,515

Int. Cl.[2] C11D *7/08, 7/34;* C23G *1/02*

U.S. Cl. 252—143 13 Claims

1. An improved organic stripping composition capable of removing polymeric organic substances from aluminized silicon dioxide substrates without dulling or corrosion of the aluminum surface, whereon such polymeric substances are deposited as photoresist materials, comprising at least one organic sulfonic acid of the following formula: $R\text{-}SO_3H$ wherein R is an organic radical selected from the group consisting of alkyl containing 1 to 18 carbon atoms, monohydroxyalkyl containing 1 to 18 carbon atoms, aryl containing 6 to 10 carbon toms, monoalkylaryl wherein the alkyl group contains 1 to 14 carbon atoms, dialkylaryl wherein each alkyl group contains 1 to 4 carbon atoms, monohydroxyaryl containing 6 to 10 carbon atoms, monoalkylhydroxyaryl containing 7 to 11 carbon atoms and monochloro-hydroxyaryl containing 6 to 10 carbon atoms and at least one organic solvent, wherein the improvement comprises incorporating fluoride ion in an amount of about 5 to 250 ppm by weight of the composition.

4,165,296

METHOD FOR REGENERATING AN OXIDATION CATALYST

Hiromichi Ishii; Hideo Matsuzawa; Masao Kobayashi, all of Otake, and Masaaki Kato, Yamaguchi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1978, Ser. No. 887,802

Int. Cl.[2] B01J *27/28, 23/92;* C07C *51/24, 45/02*

U.S. Cl. 252—412 7 Claims

7. A method for regenerating a deactivated oxidation catalyst comprising phosphorus, molybdenum, and an alkali metal deactivated by the gas phase oxidation of an unsaturated aldehyde to an unsaturated carboxylic acid, which comprises:

treating said deactivated catalyst with an aqueous solution containing ammonia and an oxidizing agent selected from the group consisting of hydrogen, peroxide, ozone, nitrogen tetraoxide and organic peroxides;

removing said solution from said treated catalyst; and drying the separated catalyst.

4,165,297

CATALYST COMPLEX FOR THE PREPARATION OF CYANO-AZO DYESTUFFS

Gérard L. A. Belfort, Oissel, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Division of Ser. No. 784,384, Apr. 4, 1977, Pat. No. 4,126,610. This application Jul. 18, 1978, Ser. No. 925,657

Claims priority, application France, Apr. 9, 1976, 76 10421

Int. Cl.[2] B01J *31/22*

U.S. Cl. 252—429 R 9 Claims

1. A catalyst complex of the formula:

$$[NC\text{—}R\text{—}S\text{—}(R')_m\text{—}CN].[CuHal]$$

in which R and R'are identical or different and represent alkylene having from 1 to 6 carbons in a straight chain or in a branched chain and which may contain an —O— or —S— bridge; m is 0 or 1; and Hal is selected from the group consisting of fluorine, chlorine, bromine and iodine.

4,165,298

CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Akinobu Shiga; Yoshiharu Fukui; Kazuhiro Matsumura; Toshio Sasaki, and Masahisa Okawa, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,630

Claims priority, application Japan, Sep. 8, 1976, 51/108276; Oct. 22, 1976, 51/127705

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B 34 Claims

1. A method for preparing a solid titanium trichloride catalyst, which comprises treating at about −30° to about 200° C. for about 5 minutes to about 5 hours a titanium trichloride composition or a pulverized product thereof with a mixture of

(1) about 0.001 to about 2.0 moles per mole of titanium chloride in the titanium trichloride composition of at least one halogen or halogen compound selected from the group consisting of (a) a halogen expressed by the general formula

$$X_2$$

wherein X represents Cl, Br or I, (b) an interhalogen compound expressed by the general formula

$$XX'_a$$

wherein X and X', which are different, each represents Cl, Br or I, and a is 1 or 3, and (c) an iodinated hydrocarbon compound expressed by the general formula

$$R_3\text{—}I$$

wherein R_3 represents a straight-chain or branched-chain alkyl group containing 2 to 18 carbon atoms, and

(2) about 0.001 to about 5.0 moles per mole of titanium trichloride in the titanium trichloride composition of an ether compound expressed by the general formula

$$R_1\text{—}O\text{—}R_2$$

wherein R_1 and R_2, which may be the same or different, each represents a straight-chain or branched-chain alkyl group containing 1 to 8 carbon atoms.

4,165,299

PREPARATION OF A SINGLE PHASE VANADIUM (IV) BIS (METAPHOSPHATE) OXIDATION CATALYST WITH AN IMPROVED SURFACE AREA

S. Erik Pedersen, Mentor, Ohio, assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 23, 1978, Ser. No. 908,869
Int. Cl.[2] B01J *27/14;* C01B *15/16;* B01J *27/02*
U.S. Cl. 252—435 4 Claims

1. A method for the preparation of a single phase vanadium-(IV)bis(metaphosphate) oxidation catalyst for preparing maleic anhydride by oxidation of unsaturated aliphatic hydrocarbons, which catalyst has an intrinsic surface area of from about 1.5 to 5.0 m^2/gm., which comprises the steps of:

forming a solid state mixture of vanadyl sulfate and phosphorus pentoxide;

introducing said mixture into a heating zone and maintaining said zone and mixture at a temperature of at least about 325° C. for a period sufficient for the liberation of gases and forming a vanadium phosphorus reaction product;

cooling the reaction product and washing with water to essentially remove any soluble residue;

drying the water washed product and calcining in air to obtain a single phase vanadium(IV)bis(metaphosphate) catalyst having an intrinsic surface area of from about 1.5 to 5.0 m^2/gm.

4,165,300

OXIDATION CATALYSTS

Serge R. Dolhyj, Parma, and Ernest C. Milberger, Solon, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 640,997, Dec. 15, 1975, Pat. No. 4,021,427. This application Mar. 21, 1977, Ser. No. 779,425
The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.
Int. Cl.[2] B01J *23/10, 23/22*
U.S. Cl. 252—462 12 Claims

1. A catalyst composition described by the formula:

$$Y_aSb_bMo_cV_dZ_eO_x$$

wherein

Y is lithium, cerium or a mixture thereof;

Z is a metal selected from the group consisting of tungsten, magnesium, aluminum and nickel; and

wherein

a and d are numbers from about 0.01 to about 1.0;

b and c are numbers from about 1 to about 9;

e is a positive number from 0 to 1;

x is a number which satisfies the valence requirements of the other elements present; and wherein at least some of the molybdenum in the catalyst is present in a valence state below +6.

4,165,301

USES OF TERPENE DIMERS IN PERFUMERY PROCESSES AND PRODUCTS

Wilhelmus J. Wiegers, Red Bank; John B. Hall, Rumson; Ira D. Hill, Locust; Robert M. Novak, Fords; Frederick L. Schmitt; Braja D. Mookherjee, both of Holmdel; Chi-Kuen Shu, Cliffwood, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 3, 1978, Ser. No. 902,436
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 10 Claims

1. A compounded single phase liquid perfumery composition which consists essentially of a perfumery product which is a natural perfume oil or a synthetic perfume oil or a synthetic perfume chemical or a mixture of two or more natural perfume oils or a mixture of two or more synthetic perfume oils or a mixture of two or more perfume chemicals or a mixture of one or more natural perfume oils, synthetic perfume oils and perfume chemicals with which there is intimately admixed a reaction product selected from the group consisting of:

Dimerization products of alpha-pinene;

Dimerization products of beta-pinene;

Dimerization products of camphene;

Dimerization products of d-limonene;

Dimerization products of turpentine;

Hydrogenated dimerization products of alpha-pinene;

Hydrogenated dimerization products of beta-pinene;

Hydrogenated dimerization products of camphene;

Hydrogenated dimerization products of d-limonene;

Hydrogenated dimerization products of turpentine;

Mixtures of said dimerization products and mixtures of said hydrogenated dimerization products,

said reaction product being present in a concentration of from about 1 up to about 30 parts per weight per 100 parts by weight of said compounded single phase liquid perfumery composition, and said perfumery product being present in a concentration of from about 70 up to about 99 parts by weight per 100 parts by weight of said compounded single phase liquid perfumery composition.

4,165,302

FILLED RESIN COMPOSITIONS CONTAINING ATACTIC POLYPROPYLENE

Carmen F. Armenti, Trenton, N.J., and James V. De Juneas, Lake Charles, La., assignors to Cities Service Company, Tulsa, Okla.

Filed Aug. 22, 1978, Ser. No. 936,263
Int. Cl.[2] C08L *89/04*
U.S. Cl. 260—8 5 Claims

1. A method of improving the melt index of a filled thermoplastic resin composition, said composition comprising (a) a basic resin selected from the group consisting of polyethylene, polypropylene (isotactic), polybutylene, copolymers of vinyl acetate and ethylene, polystyrene, and acrylic resins, and (b) a filler consisting from the group consisting of inorganic fillers and organic fillers, comprising adding a minor amount, based on the total finished composition, of atactic polypropylene.

4,165,303

POLYMER COMPOSITIONS CONTAINING POLY (ALKYLENE ETHER) ESTERS OF POLYBASIC ACIDS

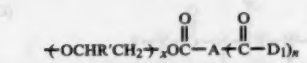
Irwin S. Schlossman, Cincinnati, Ohio, and Robert E. Wiman, Marietta, Ga., assignors to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 433,642, Jan. 16, 1974, abandoned, which is a division of Ser. No. 318,981, Dec. 27, 1972, abandoned, and a continuation-in-part of Ser. No. 183,266, Sep. 23, 1971, abandoned. This application Aug. 26, 1977, Ser. No. 828,001
Int. Cl.[2] C08L *91/00;* C08G *63/76*
U.S. Cl. 260—22 D 5 Claims

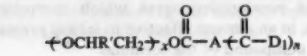
1. A fiber characterized by having improved and permanent antistatic properties consisting essentially of a polymer selected from the group consisting of nylon 6, nylon-6,6, poly-(ethylene terephthalate) and poly(1,4-cyclohexylenedimethylene terephthalate) with about 0.1 to 20% by weight of a poly-(alkylene ether) ester of a polybasic acid having the formula

$$A\left(-\overset{O}{\overset{\|}{C}}-D\right)_m$$

wherein A is a hydrocarbon radical containing from 34 to 51 carbon atoms, m is 2 or 3, and D is a radical selected from the group consisting of hydroxyl, $-OCHR'CH_2-_xOH$ or



where R' is a hydrogen, a methyl or ethyl group, x is a number from about 4 to about 450, n is 1 or 2, D_1 is a radical as defined for D and A is a hydrocarbon radical as described above, provided that at least one of the D radicals is $-(OCHR'CH_2)_xOH$ or



said poly(alkylene ether) ester being chemically incorporated into said polymer so that at least a portion of said ester is reacted into and bound to the polymer.

4,165,304

WATER-BASED COATING COMPOSITION CONTAINING POLYVINYL CHLORIDE

Kenneth G. Davis, Pittsburgh, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 782,201, Mar. 28, 1977, Pat. No. 4,116,905, which is a continuation-in-part of Ser. No. 585,938, Jun. 11, 1975, abandoned. This application Nov. 16, 1977, Ser. No. 852,166

Int. Cl.² C08L *91/00, 27/06, 67/08*

U.S. Cl. 260—22 CB **15 Claims**

1. A substrate coated with a water-based coating formulation consisting essentially of powdered polyvinyl chloride dispersed in a solution of a water-dilutable resin, having functional carboxyl or hydroxy groups, selected from the group consisting of an alkyd resin, an acrylic resin; a mixture of an acrylic resin and an aminoplast, a mixture of an acrylic resin and a 1,2-epoxy resin, and a mixture of an acrylic resin, a 1,2-epoxy resin, and a phenolic resin, water-solubilized with ammonia, NH_4OH or an amine solubilizer, in water, a mixture of water and an alcohol or ether alcohol, or a mixture of water, alcohol, and ether alcohol; the weight ratio of polyvinyl chloride to water-dilutable resin being between 15:1 and about 1:1.

4,165,305

TWO-COMPONENT BINDER FOR EXTERIOR FIBERBOARD

Richard D. Sundie, Montvale, and William R. Michael, West Orange, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 696,159, Jun. 14, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,590

Int. Cl.² C08L *61/28, 61/24*

U.S. Cl. 260—29.4 R **12 Claims**

1. A stable aqueous solution of urea, melamine and formaldehyde, which solution has a viscosity when formed of less than about 60 cps and which has a viscosity after about 7 days of less than 1,000 cps, the composition comprising, in percent by weight based upon the total weight of the composition, about 10 to 15 percent urea, about 30 to 40 percent formaldehyde, about 25 to 40 percent water, about 15 to 25 percent melamine, about 0.4 to 1.0 percent of a buffering agent which maintains the pH of the composition at a value ranging from about 6.5 to 7.0, and optionally up to about 6 percent of an alkanol of 1 to 6 carbon atoms.

4,165,306

MASS-DYEING OF POLYESTER WITH ANTHRAQUINONE AND BENZANTHRONE DYES

Rene Moissonnier, Rixheim, France, and Hans Seiler, Bubendorf, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Oct. 26, 1976, Ser. No. 735,798

Claims priority, application Switzerland, Oct. 28, 1975, 13937/75

Int. Cl.² C08K *5/18*

U.S. Cl. 260—40 P **10 Claims**

1. Mass-dyed linear, saturated, aromatic polyester, comprising, as dyestuff, a compound or mixture of compounds selected from

1-(4'-phenyl-benzoylamino)-anthraquinone,

1-(4'-para-nitrophenyl-benzoylamino)-anthraquinone,

1-(benzanthronyl-3'-amino)-anthraquinone, and

1-(benzanthronyl-3'-amino)-6,7-dichloro-anthraquinone.

4,165,307

PROCESS FOR PREPARATION OF MOLDING RESINS

Shioji Mizuno, Osaka, and Toshinori Sugie, Takaishi, both of Japan, assignors to Dai Nippon Ink & Chemicals Incorporated, Japan

Filed Apr. 11, 1977, Ser. No. 786,217

Int. Cl.² C08K *3/34, 3/40*

U.S. Cl. 260—40 TN **12 Claims**

1. A process for the preparation of molding resins comprising heating and kneading an isocyanate prepolymer derived from a hydroxyl-terminated polymer and a polyfunctional isocyanate, with a hydroxyl-terminated low-molecular-weight polybutylene terephthalate having an inherent viscosity as herein defined of 0.15 to 0.55 dl/g in the presence of a reinforcing filler by means of an extruder, the amount of said isocyanate prepolymer and said low-molecular-weight polybutylene terephthalate being such as to satisfy the following relationship:

$$(A)/(B)=(A')/(0.1\text{-}3.0)\times(B')$$

wherein A is the amount of said low-molecular-weight polybutylene terephthalate, B is the amount of said isocyanate prepolymer, A' is the hydroxyl equivalent weight (the molecular weight of said low-molecular-weight polybutylene terephthalate per hydroxyl group) of said low molecular-weight-polybutylene terephthalate and B' is the isocyanate equivalent weight (the molecular weight of said isocyanate prepolymer per isocyanate group) of said isocyanate prepolymer.

4,165,308

COATING COMPOSITIONS COMPRISING POLYMER BLENDS CONTAINING POLYSTYRENE OR POLY(α-METHYL STYRENE)

Irving Serlin, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 26, 1978, Ser. No. 909,910

Int. Cl.² C08L *25/06, 25/14, 31/04*

U.S. Cl. 260—42.52 **7 Claims**

1. A coating composition comprising an intimate polymer blend of from about 50 to about 90 parts by weight of a styrene interpolymer or a vinyl acetate polymer and from about 10 to about 50 parts by weight of a low molecular weight polystyrene or poly(α-methylstyrene) of relative viscosity in the range of about 1.04 to about 1.15 determined at 25° C. in ethyl acetate at a concentration of 2 grams per 100 ml of solution, wherein the styrene interpolymer comprises from about 30 to about 75 parts by weight of styrene, from about 69 to about 15 parts by weight of a monomer selected from the group consisting of alkyl acrylates and methacrylates containing from 4 to 15 carbon atoms and dialkyl maleates and fumarates containing from 6 to 28 carbon atoms and from about 1 to about 10 parts by weight of an unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid,

crotonic acid, and monoalkyl maleates and fumarates containing from 5 to 8 carbon atoms and wherein the vinyl acetate polymer is selected from the group consisting of polyvinyl acetate and interpolymers of vinyl acetate comprising from about 60 to about 90 parts by weight of vinyl acetate, from about 9 to about 30 parts by weight of a monomer selected from the group consisting of alkyl acrylates containing from 4 to 7 carbon atoms, dialkyl maleates and fumarates containing from 6 to 12 carbon atoms, and vinyl esters of monocarboxylic acids containing from 5 to 20 carbon atoms, and from about 1 to 10 parts by weight of an unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid and monoalkyl maleates and fumarates containing from 5 to 8 carbon atoms.

4,165,309
FLAME RETARDANT POLYMER COMPOSITION

Ivor R. Fielding, Naperville; Wassily Poppe, Lombard, and Francis J. Slama, Aurora, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 10, 1978, Ser. No. 949,655
Int. Cl.[2] C08K *5/02, 5/03, 5/09, 3/32*
U.S. Cl. 260—45.8 A **7 Claims**

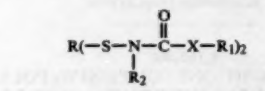
1. A flame retardant composition comprising a resinous polymer chosen from the group consisting of a resinous polymer of propylene, a resinous polymer of styrene, and a resinous poly(alkylene terephthalate); a primary flame retardant comprising a chlorine or bromine containing organic compound; ammonium polyphosphate; and ammonium nitrate.

4,165,310
SCORCH INHIBITED VULCANIZABLE RUBBER COMPOSITIONS CONTAINING CARBAMIC ACID ESTERS

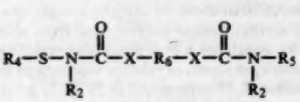
Eiichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 929,621, Jul. 31, 1978, abandoned. This application Sep. 27, 1978, Ser. No. 946,257
Int. Cl.[2] C08K *5/44;* **C07C** *155/08, 155/09, 155/02*
U.S. Cl. 260—45.85 A **46 Claims**

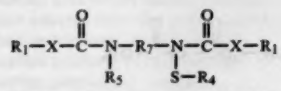
1. A vulcanizable rubber composition inhibited from premature vulcanization comprising sulfur-vulcanizable rubber, sulfur vulcanizing agent, organic vulcanization accelerating agent, and, in an amount effective to inhibit premature vulcanization, a compound of the formula


(A)

wherein X is oxygen or sulfur, R_1 is C_1–C_{12} alkyl, C_7–C_{10} aralkyl, C_5–C_{12} cycloalkyl, or R_2; R_2 is phenyl, naphthyl and phenyl substituted by $(-R_3)_n$ wherein n is 1, 2, 3 and R_3 is C_1–C_{12} alkyl, C_1–C_{12} alkoxy, C_1–C_{12} alkylthio, chloro, bromo, cyano or nitro, and R is C_1–C_{12} primary or secondary alkylene or phenylene di-C_1–C_6-primary or secondary alkylene;

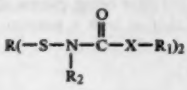

(B)

wherein X and R_2 are the same as before, and R_4 is C_1–C_{12} primary or secondary alkyl or said alkyl radical substituted by formyl or C_2–C_7 acyl, C_7–C_{10} aralkyl, C_5–C_{12} cycloalkyl, or R_2; R_5 is hydrogen or —SR_4 and R_6 is phenylene, mono- or di-C_1–C_6 alkyl substituted phenylene, C_2–C_6 alkylene, phenylene-methylene, or C_1–C_6 alkylene diphenylene or C_1–C_6 alkylene di(mono- or di-C_1–C_6 alkyl substituted phenylene), or

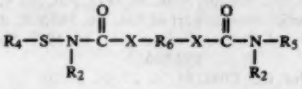

(C)

wherein X, R_1, R_4 and R_5 are the same as before, and R_7 is phenylene, mono- or di-C_1–C_4 alkyl substituted phenylene, or C_1–C_6 alkylene diphenylene.

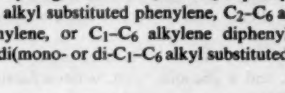
24. A method of inhibiting premature vulcanization of sulfur vulcanizable rubber containing a sulfur vulcanizing agent and organic vulcanization accelerating agent which comprises incorporating therein, in an amount effective to inhibit premature vulcanization, a compound of the formulas


(A)

wherein X is oxygen or sulfur, R_1 is C_1–C_{12} alkyl, C_7–C_{10} aralkyl, C_5–C_{12} cycloalkyl, or R_2; R_2 is phenyl, naphthyl and phenyl substituted by $(-R_3)_n$ wherein n is 1, 2, 3 and R_3 is C_1–C_{12} alkyl, C_1–C_{12} alkoxy, C_1–C_{12} alkylthio, chloro, bromo, cyano or nitro, and R is C_1–C_{12} primary or secondary alkylene or phenylene di-C_1–C_6-primary or secondary alkylene;


(B)

wherein X and R_2 are the same as before, and R_4 is C_1–C_{12} primary or secondary alkyl or said alkyl radical substituted by formyl or C_2–C_7 acyl, C_7–C_{10} aralkyl, C_5–C_{12} cycloalkyl, or R_2; R_5 is hydrogen or —SR_4 and R_6 is phenylene, mono- or di-C_1–C_6 alkyl substituted phenylene, C_2–C_6 alkylene, phenylene-methylene, or C_1–C_6 alkylene diphenylene or C_1–C_6 alkylene di(mono- or di-C_1–C_6 alkyl substituted phenylene), or


(C)

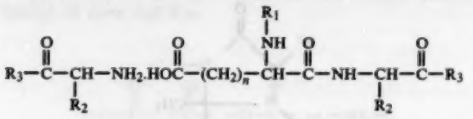
wherein X, R_1, R_4 and R_5 are the same as before, and R_7 is phenylene, mono- or di-C_1–C_4 alkyl substituted phenylene, or C_1–C_6 alkylene diphenylene.

4,165,311
ADDITION COMPOUND OF DIPEPTIDE DERIVATIVE AND AMINO ACID DERIVATIVE

Yoshikazu Isowa; Muneki Ohmori, both of Tokyo; Kaoru Mori; Tetsuya Ichikawa, both of Sagamihara; Yuji Nonaka, Shin-nanyo; Keiichi Kihara, Shin-nanyo; Kiyotaka Oyama, Shin-nanyo; Heijiro Satoh, Shin-nanyo, and Shigeaki Nishimura, Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co. Ltd., Tokyo and (Zaidanhojin) Sagami Chemical Research Center, Yamaguchi, both of, Japan

Filed Jan. 17, 1978, Ser. No. 870,108
Claims priority, application Japan, Jan. 27, 1977, 52-7279; May 19, 1977, 52-57036
Int. Cl.[2] C07C *103/52;* **C12B** *1/00*
U.S. Cl. 260—112.5 R **21 Claims**

1. An addition compound having the formula



wherein R_1 represents an aliphatic oxycarbonyl group, benzyloxycarbonyl group which can have nuclear substituents, benzoyl, aromatic sulfonyl or aromatic sulfinyl group; R_2 represents methyl, isopropyl, isobutyl, isoamyl or benzyl group; R_3 represents a lower alkoxyl, benzyloxy, or benzhydryloxy group and n represents 1 or 2.

4,165,312

PHOSPHORYLATED NONAPEPTIDES, PROCESSES FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Guido A. Schoenenberger, Reinach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

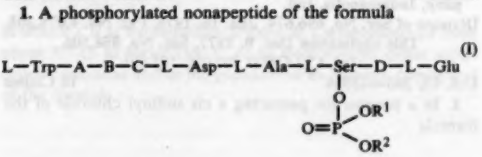
Filed Jun. 26, 1978, Ser. No. 919,046

Claims priority, application Switzerland, Jun. 30, 1977, 8092/77

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **4 Claims**

1. A phosphorylated nonapeptide of the formula



(I)

wherein

A represents L- or D-alanine,

B, C and D represent Gly or D-alanine, and

R^1 and R^2 represent hydrogen or alkyl.

4,165,313

PROCESS FOR DEODORIZING FOAMING AGENTS FOR THE MANUFACTURE OF AIR FOAMS

Albert Schlegel, Frankfurt am Main, and Peter Wirtz, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,909

Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619088

Int. Cl.[2] A23J *1/10;* **C07G** *7/06*

U.S. Cl. 260—123.7 **6 Claims**

1. A process for making an aqueous solution of a keratin decomposition product free from pungent sulfur compounds which comprises hydrolyzing keratin in an aqueous medium at a temperature of 100° to 200° C. to form an aqueous solution of keratin hydrolysate and pungent sulfur-containing compounds, establishing a pH of 7 to 12 in said solution and adding to said solution an amount of epoxide sufficient to react with and substantially deodorize said pungent sulfur-containing compound.

4,165,314

MIXTURES OF 1:2 COBALT COMPLEXES OF MONOAZO COMPOUNDS HAVING AN ACETOACETANILIDE COUPLING COMPONENT RADICAL

Hanspeter Uehlinger, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

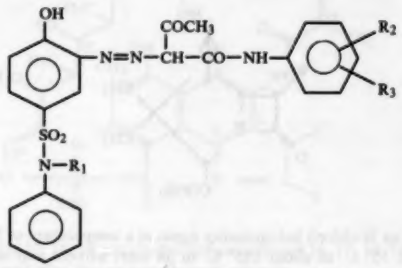
Filed Jul. 5, 1977, Ser. No. 812,826

Claims priority, application Switzerland, Jul. 12, 1976, 8903/76

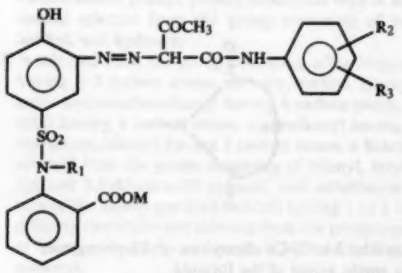
Int. Cl.[2] C09B *45/20*

U.S. Cl. 260—145 A **28 Claims**

1. A mixture of symmetrical and asymmetrical 1:2 cobalt complexes of a mixture of a compound of the formula



and a compound of the formula



the molar ratio of the former to the latter being 4:1 to 1:4, wherein

each R_1 is independently hydrogen or C_{1-4} alkyl,

each R_2 and R_3 is independently hydrogen, halo, C_{1-4} alkyl or C_{1-4} alkoxy,

M is hydrogen or a non-chromophoric cation, and

the negative charge of the complex anion of each 1:2 cobalt complex is balanced by hydrogen or a non-chromophoric cation.

4,165,315

SULFINYL HALIDES AND THEIR PREPARATION FROM PENICILLIN SULFOXIDES

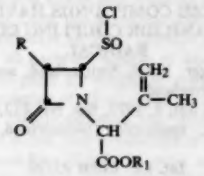
Stjepan Kukolja, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 673,017, Apr. 2, 1976, Pat. No. 4,081,440, which is a continuation-in-part of Ser. No. 632,732, Nov. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 536,273, Dec. 24, 1974, abandoned. This application Nov. 17, 1977, Ser. No. 852,251

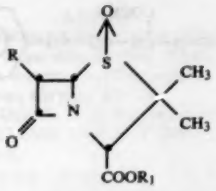
Int. Cl.[2] C07D *205/08, 501/10*

U.S. Cl. 260—239 A **19 Claims**

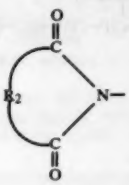
1. A process for preparing a cis sulfinyl chloride of the formula



which comprises the step of reacting a penicillin sulfoxide of the formula

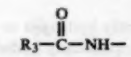


with an N-chloro halogenating agent at a temperature of from about 75° C. to about 135° C. in an inert solvent and under anhydrous conditions; in which, in the above formulae, R_1 is a carboxylic acid protecting group; and R is (1) an imido group of the formula



in which Rhd 2 is C_2-C_4 alkenylene or 1,2-phenylene;

(2) an amido group of the formula



in which R_3 is

(a) hydrogen, C_1–C_3 alkyl, halomethyl, cyanomethyl benzyloxy, 4-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl;

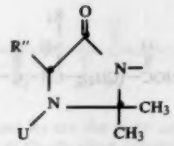
(b) the group R′ in which R′ is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

(c) a group of the formula R″-$(Q)_m$-CH_2- in which R″ is R′ as defined above, 1,4-cyclohexadienyl, 2-thienyl, or 3-thienyl; m is 0 or 1; and Q is O or S; subject to the limitation that when m is 1, R″ is R′; or

(d) a group of the formula

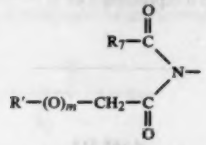
in which R″ is as defined above, and W is protected hydroxy or protected amino;

(3) an imidazolidinyl group of the formula



in which R″ is as defined above and U is nitroso or acetyl; or R is

(4) an imido group of the formula



in which R′ is as defined above, m is 0 or 1, and R_7 is C_1–C_3 alkyl, C_1–C_3 haloalkyl, C_1–C_3 alkoxy, or 2,2,2-trichloroethoxy.

4,165,316

PROCESS FOR PREPARING SULFINYL CHLORIDES FROM PENICILLIN SULFOXIDES

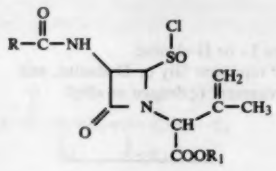
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 696,674, Jun. 16, 1976, Pat. No. 4,075,203. This application Dec. 8, 1977, Ser. No. 858,506

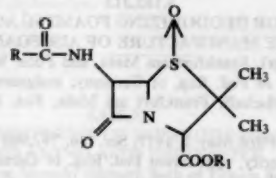
Int. Cl.[2] **C07D** *205/08, 501/10*

U.S. Cl. 260—239 A **18 Claims**

1. In a process for preparing a cis sulfinyl chloride of the formula



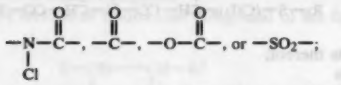
by reacting a penicillin sulfoxide of the formula



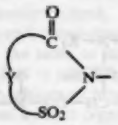
with an N-chloro halogenating agent of the formula

in which R_4 is hydrogen, chloro, C_1–C_3 alkyl, cyclohexyl, phenyl, or phenyl substituted with chloro, bromo, methyl, or nitro, and R_5 is R_6—X— in which R_6 is C_1–C_3 alkyl, cyclo-

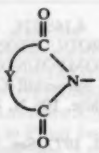
hexyl, phenyl, or phenyl substituted with chloro, bromo, methyl, or nitro, and X is



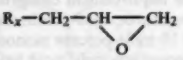
or R_4 and R_5 taken together with the nitrogen to which they are bonded define a heterocyclic structure of the formula



in which Y is o-phenylene or $-(CH_2)_n-$ in which n is 2 or 3; or a structure of the formula



in which Y is as hereinbefore defined; at a temperature of from about 75° C. to about 135° C. in an inert solvent under anhydrous conditions and in the presence of an epoxide compound of the formula



in which R_x is hydrogen or methyl, said epoxide compound being present in an amount at least sufficient to account for any hydrogen chloride which may be formed; in which, in the above formulae, R_1 is a carboxylic acid protecting group; and R is

(a) hydrogen, C_1–C_3 alkyl, halomethyl, cyanomethyl, benzyloxy, 4-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl;

(b) the group R′ in which R′ is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl,

(c) a group of the formula $R''-(Q)_m-CH_2-$ in which R″ is R′ as defined above, 1,4-cyclohexanidenyl, 2-thienyl, or 3-thienyl; m is 0 or 1; and Q is O or S; subject to the limitation that when m is 1, R″ is R′; or

(d) a group of the formuala

in which R″ is as defined above, and W is protected hydroxy or protected amino; the improvement which comprises the step of carrying out the reaction in the presence of from about 100 grams to about 500 grams of calcium oxide per mole of the penicillin sulfoxide.

4,165,317

RIFAMYCIN COMPOUNDS

Vittorio Rossetti; Leonardo Marsili, and Carmine Pasqualucci, all of Milan, Italy, assignors to Archifar Laboratori Chimico Farmacologici S.p.A., Rovereto, Italy

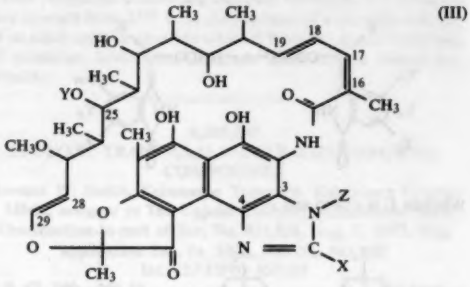
Filed Aug. 12, 1977, Ser. No. 825,166

Claims priority, application Italy, Sep. 30, 1976, 5209 A/76

Int. Cl.[2] C07D *498/18*

U.S. Cl. 260—239.3 P **1 Claim**

1. A rifamycin compound of the formula



(III)

and 16, 17, 18, 19 tetrahydro derivatives and 16, 17, 18, 19, 28, 29 hexahydro derivatives thereof, wherein:

Y is —H or —$COCH_3$;

Z is an alkyl having 1–4 carbon atoms, cycloalkyl having 3–6 carbon atoms, phenyl, phenyl substituted with at least one radical selected from the group consisting of halogen, methyl, and hydroxy;

X is selected from the group consisting of hydrogen, alkyl having 1–5 carbon atoms, carboxy, formyl, phenyl, aromatic hydrocarbonalkenyl having 8 carbon atoms, cycloalkyl having 6 carbon atoms, cycloalkenyl having 6 carbon atoms, alkenyl having 3 carbon atoms, a heterocyclo selected from the group consisting of thienyl, furyl, pyridyl and 5,6-dihydro-2H-pyranyl, and substitution products of the above specified radicals having 1 or 2 radicals different therefrom and selected from the group consisting of halogen, methyl, methoxyl, N,N-dimethylamino and carboxyl.

4,165,318

FORMALDEHYDE STABILIZED COATING COMPOSITIONS

Stanley A. Greenfield, Ambler, and John A. Dupont, Glenside, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 830,716, Sep. 6, 1977, Pat. No. 4,129,448, which is a continuation-in-part of Ser. No. 389,745, Aug. 20, 1973, abandoned. This application Sep. 18, 1978, Ser. No. 944,830

Int. Cl.[2] C07D *275/00, 277/00*

U.S. Cl. 260—302 A **5 Claims**

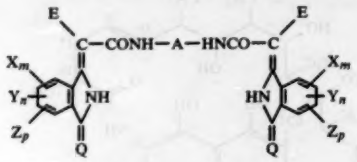
1. In a solution of a 3-isothiazolone in a polar organic solvent, the improvement wherein the solution further comprises a stabilizing amount of formaldehyde.

4,165,319
ISOINDOLINE PIGMENTS

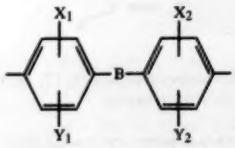
Jost von der Crone, Riehen, and Christoph Frey, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

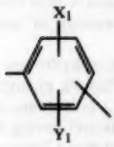
Filed Jul. 18, 1977, Ser. No. 816,839
Claims priority, application Switzerland, Jul. 26, 1976, 9621/76
Int. Cl.² C07D *208/46, 209/50*
U.S. Cl. 260—325 PH **7 Claims**

1. A bis-isoindoline pigment of the formula



wherein E is cyano and A is





or 1,5- or 2,6-naphthylene.

where B is a direct bond, —O—, —S—, —C_1–C_4-alkylene, -C_1–C_4-alkylenedioxy, phenylenedioxy, sulfonyl or —NHCO—; and X_1, X_2, Y_1 and Y_2 are independently hydrogen, chloro, C_1–C_4 alkyl or C_1–C_4 alkoxy;

Q is oxo or imino;

X is hydrogen;

Y is chloro or bromo;

m and n are integers from 0–4;

p is an integer from 0 to 1, with the proviso that the sum of m+n+p must be 4; and

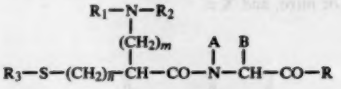
Z is nitro or C_2–C_5 alkoxycarbonyl when p is 1 and m is 3; or is chloro or RW— where W is —O— or —S— when p is 1, and n is 3, where R is C_1–C_4-alkyl, phenyl, or phenyl substituted in the o-, p- or m- position by halo, C_1–C_4-alkyl or C_1–C_4 alkoxy.

4,165,320
AMINO ACID DERIVATIVES

Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 759,685, Jan. 17, 1977, Pat. No. 4,113,715. This application Jun. 29, 1978, Ser. No. 920,426
Int. Cl.² C07D *209/10*
U.S. Cl. 260—326.12 R **9 Claims**

1. A compound of the formula



and salts thereof,

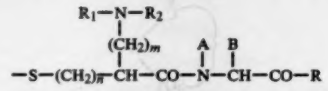
wherein

R is hydroxy or lower alkoxy

R_1 is hydrogen, lower alkanoyl or amino (imino)methyl;

R_2 is hydrogen, lower alkyl or phenyl-lower alkylene;

R_3 is hydrogen, lower alkanoyl, benzoyl or



A is hydrogen, lower alkyl or hydroxy-lower alkylene;

B is indolyl-lower alkylene;

m is 1, 2, 3 or 4; and

n is 0 or 1.

4,165,321
PROCESS FOR THE PRODUCTION OF HETEROCYCLIC COMPOUNDS

Eugene G. Harris, 7029 Sprucehill Cir., West Chester, Ohio 45069, and John F. White, 106 N. Pleasant St., Ridgewood, N.J. 07450

Filed Sep. 21, 1977, Ser. No. 835,253
Int. Cl.² C07D *323/00, 327/00, 321/00, 313/00*
U.S. Cl. 260—340.2 **13 Claims**

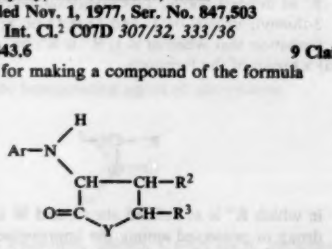
1. In a process for the production of hetero-macrocyclic compounds selected from the group consisting of cyclic esters and lactones having 8 to 20 carbon atoms in the ring by depolymerization of a linear polyester and ring closure at an elevated temperature and reduced pressure and in the presence of a metal catalyst, the improvement comprising conducting the process as a continuous or semi-continuous operation in the presence of 0.75 to 10 mole percent monocarboxylate derived from an aliphatic monocarboxylic acid having 6 to 40 carbon atoms and with agitation which provides top-to-bottom mixing throughout essentially the total volume of the reaction mass in an inverted multiple-blade conical vessel wherein the blades have a helical configuration and are arranged to rotate throughout essentially the entire reaction mass and in close proximity to the interior surface of said conical vessel and in a direction which provides a downward flow within the reaction mixture.

4,165,322
ALKYLATION OF ANILINE WITH A LACTONE IN THE PRESENCE OF WATER

Richard N. Reynolds, Jr., Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 1, 1977, Ser. No. 847,503
Int. Cl.² C07D *307/32, 333/36*
U.S. Cl. 260—343.6 **9 Claims**

1. A process for making a compound of the formula



(I)

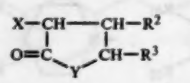
wherein

Ar is phenyl or phenyl substituted with the same or different

subsituents selected from 1 to 5 alkyl or alkoxy groups of 1 to 4 carbon atoms; 1 to 2 fluoro, chloro or bromo; and 1 nitro;

R^2 and R^3 are hydrogen or alkyl of 1 to 4 carbon atoms; and Y is 0 or S which comprises:

reacting a lactone or thiolactone compound of the formula



(II)

wherein X is chloro, iodo or bromo; Y is O or S; and R^2 and R^3 are as previously defined;

with an aniline compound, unsubsituted or substituted in the aromatic ring with the same or different substituents selected from 1 to 5 alkyl or alkoxy groups of 1 to 4 carbon atoms; 1 to 2 fluoro, chloro or bromo; and 1 nitro, in the presence of water and an inert organic solvent at a temperature between 80° and 160° to form the compound of Formula I in a reaction zone and wherein the lactone or thiolactone compound and the water are fed to the reaction zone in a ratio of 1 mol of the lactone or thiolactone per 1–40 mols of the water.

4,165,323

9-HYDROXYHEXAHYDRODIBENZO[B,D]PYRANS, 1-SUBSTITUTED-9-HYDROXYHEXAHYDRODIBENZO[b,d]PYRANS AND INTERMEDIATES THEREFOR

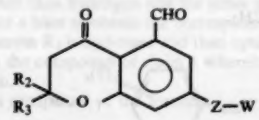
Michael R. Johnson, and Lawrence S. Melvin, Jr., both of Gales Ferry, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 804,306, Jun. 7, 1977, Pat. No. 4,118,559. This application May 9, 1978, Ser. No. 904,192

Int. Cl.[2] C07D *311/42*

U.S. Cl. 260—345.2 **6 Claims**

1. A compound having the formula



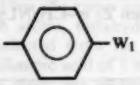
wherein each of R_2 and R_3 is selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of

(a) alkylene having from one to ten carbon atoms;

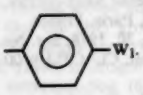
(b) $-(alk_1)_m-O-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from one to ten carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than ten; each of m and n is 0 or 1; and

W is selected from the group consisting of hydrogen, pyridyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro.

2. A compound according to claim 1 wherein Z is $-(alk_1)_m-O-(alk_2)_n-$ and W is



4,165,324

REMOVAL OF PHTHALIDE FROM IMPURE PHTHALIC ANHYDRIDE

Hobe Schroeder, Warrenville, and Stanley J. Kulpa, Chicago, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 898,930

Int. Cl.[2] C07D *307/89*

U.S. Cl. 260—346.7 **3 Claims**

1. A method of decreasing the phthalide content of impure phthalic anhydride during its heat treatment in the liquid phase which comprises conducting said heat treatment at a temperature upward from 250° C. in the presence of a catalytic amount of an alkali metal hydroxide selected from the group consisting of potassium hydroxide, rubidium hydroxide or cesium hydroxide.

4,165,325

11-DEOXY-TRANS-4,5,13,14-TETRADEHYDRO-PGI$_1$ COMPOUNDS

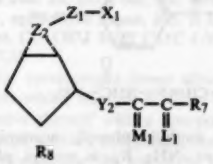
Herman W. Smith, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 821,536, Aug. 3, 1977. This application Jun. 14, 1978, Ser. No. 915,348

Int. Cl.[2] C07D *307/93*

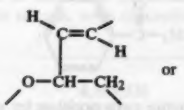
U.S. Cl. 260—346.22 **72 Claims**

1. A prostacyclin analog of the formula



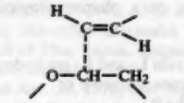
wherein Y_2 is -C≡C-;

wherein Z_2 is



(1)

or



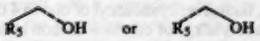
(2)

wherein Z_1 is

(1) $-(CH_2)_g-CH_2-CH_2-$, or

(2) $-(CH_2)_g-CH_2-CF_2-$,

wherein g is the integer zero, one, or 2; wherein R_8 is hydrogen or hydroxymethyl; wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,

wherein L_1 is

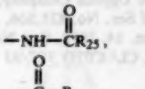
or a mixture of

and

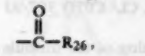
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein X_1 is

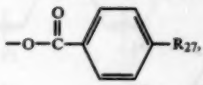
(1) $-COOR_1$ wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



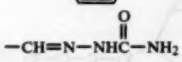
(a)



(b)

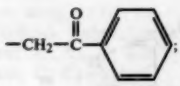


(c)



(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{26} is methyl, phenyl, $-NH_2$, or methoxy; and R_{27} is hydrogen or acetamido; inclusive, phenacyl, i.e.,



phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;

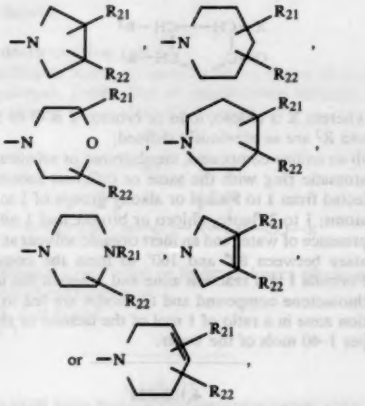
(2) $-CH_2OH$;

(3) $-CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms inclusive or

(4) $-COL_4$, wherein L_4 is

(a) amino of the formula $-NR_{21}R_{22}$; wherein R_{21} and R_{22} are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive: hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro; carboxyalkyl of one to 4 carbon atoms, inclusive, carbamoylalkyl of one to 4 carbon atoms, inclusive; cyanoalkyl of one to 4 carbon atoms, inclusive: acetylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive; or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive; hydroxyalkyl of one to 4 carbon atoms, inclusive; dihydroxylakyl of one to 4 carbon atoms, and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



wherein R_{21} and R_{22} are as defined above;

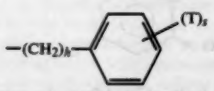
(c) carbonylamino of the formula $-NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(d) sulfonylamino of the formula $-NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

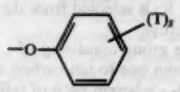
(e) hydrazino of the formula $-NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula $-NR_{21}R_{22}$, as defined above, or cycloamino, as defined above;

wherein R_7 is

(1) $-(CH_2)_m-CH_3$,



(2)



(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3 inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when Z_1 is $-CH_2NL_2L_3$.

4,165,326

STEROIDS AND THEIR PREPARATION

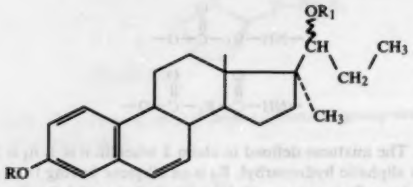
Roland Bardoneschi, Vaujours; Alain Jouquey, Paris, and Daniel Philibert, La Varenne Saint-Hilaire, all of France, assignors to Roussel Uclaf, Paris, France

Filed Mar. 30, 1978, Ser. No. 891,722

Int. Cl.[2] C07J 9/00

U.S. Cl. 260—397.5 **11 Claims**

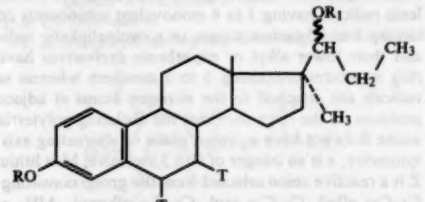
1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, tetrahydropryanyl, trityl and trimethylsilyl, R_1 is selected from the group consisting of hydrogen, acyl of an alkanoic acid of 1 to 5 carbon atoms and tetrahydropyranyl and the wavy line indicates that the OR_1 group may be in either position about the carbon atoms.

6. A process for the preparation of a compound of claim 1 comprising reacting 3-methoxy-17α-methyl-19-nor-$\Delta^{1,3,5(10)}$-pregnatriene-20-one with a methyl halide to obtain 3-methoxy-17α,21-dimethyl-19-nor-$\Delta^{1,3,5(10)}$-pregnatriene-20-one, reacting the latter with a reducing agent to form 3-methoxy-17α,21-dimethyl-19-nor-$\Delta^{1,3,5(10)}$-pregnatriene-20ξ-ol, subjecting the latter to the Birch reaction with lithium in ammonia to form 17α,21-dimethyl-19-nor-$\Delta^{5(10)}$-pregnene-20ξ-ol-3-one, isomerizing the latter with a strong acid to form 17α,21-dimethyl-19-nor-Δ^4-pregnene-20ξ-ol-3-one, reacting the latter with an etherification or esterification agent to obtain 17α,21-dimethyl-20ξ-OR_1'-19-nor-Δ^4-pregnene-3-one wherein R_1' is acyl of an alkanoic acid of 1 to 5 carbon atoms or tetrahydropyranyl, reacting the latter with a halogenation agent to form 2,6-dihalo-17α,21-dimethyl-20ξ-OR_1'-19-nor-Δ^4-pregnene-3-one, subjecting the latter to deshalohydration with an alkali metal halide in dimethylformamide to form 17α,21-dimethyl-20ξ-OR_1'-19-nor-$\Delta^{1,3,5(10),6}$-pregnatetraene-3-one, reacting the latter with an alkylation agent selected from the group consisting of dihydropyran, trityl chloride and trimethylsilyl chloride to obtain the corresponding compound of claim 1 wherein R and R_1 are other than hydrogen and the latter may be reacted with an acid or a base to obtain the corresponding compound of claim 1 wherein R_1 is hydrogen and then optionally with an acid to obtain the compound of claim 1 wherein R and R_1 are both hydrogen.

9. A tritium compound of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, tetrahydropyranyl, trityl and trimethylsilyl, R_1 is selected from the group consisting of hydrogen, acyl of an alkanoic acid of 1 to 5 carbon atoms and tetrahydropyranyl, the wavy line means that the OR_1 group may be in either position about the carbon atoms.

11. A process for the preparation of (6,7-H^3) 3-OR-17α,21-dimethyl-20ξ-OR_1-19-nor-$\Delta^{2,5(10)}$-pregnadiene wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, tetrahydropyranyl, trityl and trimethylsilyl, R_1 is selected from the group consisting of hydrogen, acyl of an alkanoic acid of 1 to 5 carbon atoms, and tetrahydropyranyl, the wavy line means that the OR_1 group may be in either position about the carbon atoms comprising reacting a compound of claim 1 with tritium hydrogen in the presence of a catalyst to form the corresponding (6,7-H^3) 3-OR-17α,21-dimethyl-20ξ-OR_1-19-nor-$\Delta^{1,3,5(10)}$-pregnatriene and when R is methyl, reacting the latter with lithium in ammonia in the presence of ethanol according to the Birch reaction to obtain when R_1 is hydrogen or acyl of an alkanoic acic of 1 to 5 carbon atoms (6,7-H^3) 3-methoxy-17α,21-dimethyl-19-nor-$\Delta^{2,5(10)}$-pregnadiene-20ξ-ol or when R_1 is tetrahydropyranyl (6,7-H^3) 3-methoxy-17α,21-dimethyl-20ξ-tetrahydropyranyloxy-19-nor-$\Delta^{2,5(10)}$-pregnadiene or when R is other than methyl or hydrogen and R_1 is other than hydrogen, reacting the said product with an acid such as acetic acid or a hydrogen halide such as hydrochloric acid to form (6,7-H^3) 17α,21-dimethyl-20ξ-OR_1-19-nor$\Delta^{1,3,5(10)}$-pregnatriene-3-ol, treating the latter with a methylation agent such as dimethyl sulfate to obtain (6,7-H^3) 3-methoxy-17α,21-dimethyl-20ξ-OR_1-19-nor-$\Delta^{1,3,5(10)}$-pregnatriene and subjecting the latter to the Birch reaction with lithium in ammonia in the presence of ethanol to obtain when R_1 is hydrogen or acyl of an alkanoic acid (6,7-H^3) 3-methoxy-17α,21-dimethyl-19-nor-$\Delta^{2,5(10)}$-pregnadiene-20ξ-ol or when R_1 is tetrahydropyranyl (6.7-H^3) 3-methoxy-17α,21-dimethyl-20ξ-tetrahydropyranyloxy-19-nor-$\Delta^{2,5(10)}$-pregadiene.

4,165,327

PROCESS FOR PRODUCING LOWER ALLERGENIC LANOLIN OR DERIVATIVES THEREOF

Makoto Yamanaka, Koganei; Satoshi Takano, Funabashi; Tsuruo Mikata, Kashiwa, and Kikuhiko Okamoto, Koshigaya, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,870

Claims priority, application Japan, Jul. 7, 1976, 51/80571

Int. Cl.[2] **C07J** *9/00;* **C11C** *1/08*

U.S. Cl. 260—397.25 **7 Claims**

1. A process for producing a lower allergenic lanolin or derivative thereof, which comprises liquid-liquid extracting lanolin or derivative thereof with a non-polar hydrocarbon solvent and a mixed solvent comprising water and a lower alcohol, and then collecting the non-polar hydrocarbon solvent fraction, wherein said liquid-liquid extraction is carried out to an extent such that said lower allergenic lanolin contains substantially no component having an Rf value of less than 0.38 when subjected to thin layer chromatography on 0.25 mm thick magnesium silicate, with chloroform as the developing solvent.

4,165,328

PROCESS FOR SEPARATING 11-CYANOUNDECANOIC ACID, CYCLOHEXANONE AND ε-CAPROLACTAM

Kenji Nishimura; Haruhiko Miyazaki; Kenji Kuniyasu, and Satoru Ono, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Apr. 28, 1978, Ser. No. 901,089

Claims priority, application Japan, May 4, 1977, 52-50670; May 4, 1977, 52-50671

Int. Cl.[2] **C07C** *121/407*

U.S. Cl. 260—404 **8 Claims**

1. In a process for separating 11-cyanoundecanoic acid from the product obtained by pyrolyzing 1,1'-peroxydicyclohexylamine which product contains ε-caprolactam in the presence of steam at a temperature in the range of from 300° C. to 1,000° C., the improvement which comprises the steps of:

(a) contacting the pyrolysis product with a mixture comprised of aqueous ammonia and at least one organic solvent selected from benzene, toluene and xylene,;

(b) separating the so prepared liquid into an oily layer and an aqueous layer;

(c) acidifying said aqueous layer to a pH of below 4.0 with a mineral acid,

(d) maintaining the acidified liquid at a temperature in the range of from 40° to 100° C. so as to obtain crude 11-cyanoundecanoic acid in molten form,

(e) separating said crude 11-cyanoundecanoic acid from said liquid;

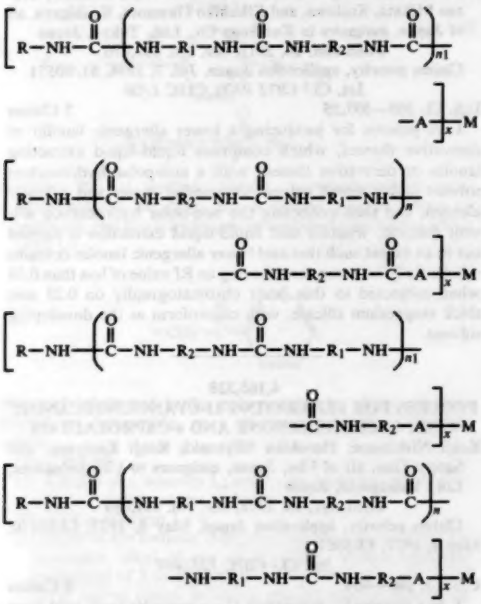
(f) washing the crude molten 11-cyanoundecanoic acid with hot water to separate ϵ-caprolactam therefrom.

4,165,329
GREASE THICKENING AGENT

John L. Dreher, El Cerrito, and Garth M. Stanton, San Anselmo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 259,052, Jun. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 59,780, Jul. 24, 1970, abandoned, Ser. No. 259,053, Jun. 2, 1972, Pat. No. 3,769,212, Continuation-in-part of said Ser. No. 59,780, Jul. 24, 1970, abandoned. This application Aug. 20, 1976, Ser. No. 716,318
Int. Cl.[2] C09F 5/00; C11C 3/00; C10M 1/32
U.S. Cl. 260—404.5 13 Claims

1. A mixture of polyurea metal salts having predominant structures presented in one of the following formulas:



wherein:

n is an integer from 0 to 3;

n_1 is an integer from 1 to 3;

x is an integer from 1 to 2 and equal to the primary valence of M divided by the number of carboxyl groups in A;

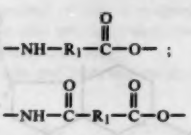
R is the same or different hydrocarbyl having from 2 to 30 carbon atoms;

R_1 is the same or different hydrocarbylene having from 2 to 30 carbon atoms;

R_2 is the same or different hydrocarbylene having from 2 to 30 carbon atoms;

M is a metal selected from Groups IA and IIA and aluminum; and

A is a divalent radical selected from the group consisting of:



3. The mixtures defined in claim 1 wherein n is 1, n_1 is 2, R is an aliphatic hydrocarbyl, R_1 is an alkylene having from 2 to 8 carbons; R_2 is an aromatic hydrocarbylene and A is a divalent radical.

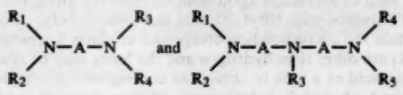
4,165,330
ASYMMETRIC SYNTHESIS VIA OPTICALLY ACTIVE CHELATING AGENTS

Thomas A. Whitney, Roselle, and Arthur W. Langer, Jr., Watchung, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 462,328, Apr. 19, 1974, abandoned, which is a division of Ser. No. 276,784, Jul. 31, 1972, abandoned. This application Feb. 13, 1978, Ser. No. 877,353
Int. Cl.[2] C07F 7/08; C07C 29/14, 31/18, 33/00
U.S. Cl. 260—448.2 B 6 Claims

1. An asymmetric synthesis process for preparing optically active compounds which comprises the step of reacting an:

(a) organolithium compound complexed to an optically active chelating agent selected from the group consisting of Chel*•M-Z_m wherein Chel* has a formula selected from the group consisting of:



wherein R_1 is a C_1 to C_{20} hydrocarbyl radical; R_2, R_3, R_4 and R_5 are the same or different alkyl or aryl radicals of 1 to 7 carbon atoms inclusive; A is selected from the group consisting of a nonreactive group containing 2 to 3 methylenic radicals having 1 to 6 monovalent substituents containing 1 to 10 carbon atoms, or a cycloaliphatic radical and their lower alkyl or naphthenic derivatives having ring structures containing 5 to 7 members wherein said radicals are attached to the nitrogen atoms at adjacent positions on the rings such that the chelating polytertiary amine does not have a center, plane or alternating axis of symmetry; x is an integer of 0 to 3 inclusive; M is lithium; Z is a reactive anion selected from the group consisting of C_1–C_{30} alkyl, C_6–C_{30} aryl, C_2–C_{30} alkynyl, AlH_4 and BH_4; m is 1; with

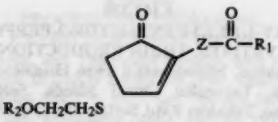
(b) a prochiral unsaturated carbonyl compound.

4,165,331
11-(2-HYDROXYETHYLTHIO)PROSTENOIC ACID E SERIES DERIVATIVES

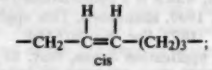
Martin J. Weiss, Oradell, N.J., and Gerald J. Siuta, Yonkers, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 782,853, Mar. 30, 1977, Pat. No. 4,085,272. This application Oct. 17, 1977, Ser. No. 842,843
Int. Cl.[2] C07F 7/18
U.S. Cl. 260—448.8 R 9 Claims

1. A compound of the formula:



wherein Z is a divalent moiety selected from the group consisting of $-(CH_2)_6-$ and



R_1 is selected from the group consisting of hydroxy; C_1–C_6 alkoxy, trityloxy, tetrahydropyranyloxy and tri-(C_1–C_6)alkylsilyloxy; and R_2 is selected from the group consisting of hydrogen, trityl, tetrahydropyranyl and tri-(C_1–C_6)alkylsilyl.

4,165,332

PREPARATION OF ALIPHATIC PERCHLORATES AND OF TRIFLUOROMETHANE SULFONATES

Charles D. Beard, Yorktown Heights, N.Y., and Kurt Baum, Pasadena, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,395

Int. Cl.² C07C *71/00*

U.S. Cl. 260—453 R **10 Claims**

1. A method of preparing alkyl perchlorate and triflates which comprises reacting at a temperature from about 5° C. to about 50° C. an alkyl iodide with a silver salt selected from the class consisting of silver perchlorate and silver triflate in an amount of benzene sufficient to provide at most a 75 percent product solution.

4,165,333

ANTIOXIDANTS

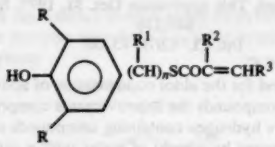
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 21, 1978, Ser. No. 879,533

Int. Cl.² C07C *153/11*; C08F *4/40, 4/34, 22/24*

U.S. Cl. 260—455 R **3 Claims**

1. A compound having the following structural formula:



(I)

wherein R is a tert. alkyl radical containing 4 to 8 carbon atoms, R^1, R^2 and R^3 are selected from the group consisting of hydrogen, alkyl radicals containing 1 to 4 carbon atoms and wherein n is 1 to 12.

4,165,334

DETERGENT COMPOUNDS AND COMPOSITIONS

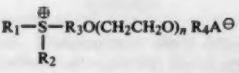
Eugene P. Gosselink, Cincinnati; James M. Richmond, Fairfield, and George E. Wentler, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 610,595, Sep. 5, 1975, abandoned. This application Jun. 7, 1977, Ser. No. 804,490

Int. Cl.² C07C *141/02, 141/16*

U.S. Cl. 260—458 R **7 Claims**

1. A detersive compound of the formula



wherein R_1 and R_2 are each straight chain, branched chain or cyclic alkyl, alkenyl, aryl, aralkyl or alkaryl moieties having from 1–30 carbon atoms; R_3 is a C_2–C_8 alkylene; R_4 is a C_1–C_8 alkylene; A is a sulfate moiety; and n is from 1 to about 100.

4,165,335

SALTS OF DICARBOXYLIC ACIDS AND DIAMINES, HAVING AN IMPROVED COLOR NUMBER, THEIR MANUFACTURE AND THEIR USE

Hugo Strehler, Frankenthal; Ernst Dietl, Ludwigshafen, and Georg Pilz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

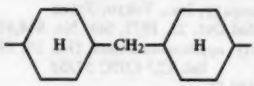
Filed Jun. 27, 1977, Ser. No. 810,273

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633110

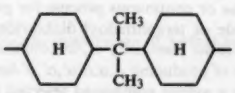
Int. Cl.² C07C *109/087, 87/14*

U.S. Cl. 260—501.2 **5 Claims**

1. Salts of alkanedicarboxylic acids of 4 to 12 carbon atoms and diamines of the formula $H_2N—R—NH_2$, where R is alkylene of 2 to 12 carbon atoms or is a radical of the formula



or



which contain up to 100 ppm of hydrazine hydrate to improve the color number, yellowness index, periodate number and UV-number of the salts.

4,165,336

(2-OXO-3-BORNYLIDENE METHYL)-BENZENE SULFONATES AND DERIVATIVES THEREOF

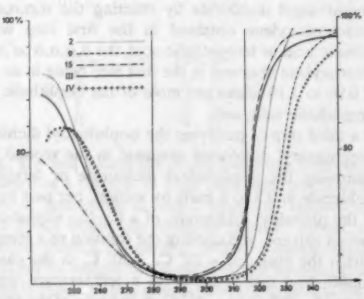
Claude Bouillon, Eaubonne; Charles Vayssie, Aulnay-sous-Bois, and Françoise Richard, Montreuil-sous-Bois, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 440,570, Feb. 7, 1974, abandoned. This application Aug. 14, 1974, Ser. No. 497,469

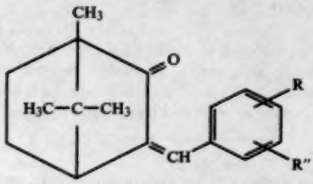
Claims priority, application Luxembourg, Feb. 19, 1973, 67061

Int. Cl.² C07C *143/24*; A61K *7/44*

U.S. Cl. 260—511 **6 Claims**



1. A compound of the formula:



(I)

wherein R represents a member selected from the group consisting of hydrogen, halogen selected from the group consisting of chlorine and fluorine, and alkyl having 1–4 carbon atoms; R″ is SO_3M wherein M represents a member selected from the group consisting of hydrogen, organic ammonium group and a metal, and R″ is a substituent at the para or meta position relative to the bornylidene ring.

4,165,337

PROCESS FOR PRODUCING PHTHALOYL DICHLORIDES OF HIGH PURITY

Shigeo Yoshinaka; Masaharu Doya; Seiji Uchiyama, and Sadao Nozaki, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,814

Claims priority, application Japan, Oct. 25, 1976, 51/127925

Int. Cl.[2] C07C *51/58*

U.S. Cl. 260—544 D **4 Claims**

1. A batchwise or continuous process for producing isophthaloyl dichloride or terephthaloyl dichloride having a high purity which consists essentially of, in combination,

(I) a first step of producing α,α,α,α′,α′,α′-hexachloroxylene by reacting a xylene compound selected from the group consisting of (i) xylene selected from meta-xylene and para-xylene and (ii) compounds resulting from the partial chlorination of the side-chain methyl groups of the xylene, with chloride under the irradiation of ultraviolet-containing rays, the reaction being carried out in the presence of, as a solvent, α,α,α,α′,α′,α′-hexachloroxylene added at the outset of the reaction; (a) the solvent being added in an amount of (1) from 0.3 to 15 times the weight of the starting xylene compound when the process is carried out in a batchwise manner or (2) in an amount of from 40 to 99% by weight of the reaction mixture when the process is carried out in a continuous manner; (b) the reaction temperature being (1) 80°–160° C. when the xylene compound is m-xylene or the compound resulting from the partial chlorination of its methyl groups or (2) 110°–160° C. when the xylene compound is p-xylene or the compound resulting from the partial chlorination of its methyl groups;

(II) a second step of producing isophthaloyl dichloride or terephthaloyl dichloride by reacting the α,α,α,α′,α′,α′-hexachloroxylene obtained in the first step with isophthalic acid or terephthalic acid, the α,α,α,α′,α′,α′-hexachloroxylene obtained in the first step being in an amount of 0.90 to 1.10 moles per mole of the isophthalic acid or terephthalic acid; and

(III) a third step of purifying the isophthaloyl dichloride or terephthaloyl dichloride obtained in the second step by dissolving the isophthaloyl dichloride or terephthaloyl dichloride in 0.3 to 6 parts by weight, per part by weight of the phthaloyl dichloride, of a C_6–C_{10} aliphatic hydrocarbon solvent, and cooling the solution to a temperature within the range of −20° C. +20° C. in the case of the isophthaloyl dichloride or to a temperature within the range of −20° C. to +50° C. in the case of the terephthaloyl dichloride thereby to recrystallize the phthaloyl dichloride.

4,165,338

2-HYDROXY-1,1,2,3,3-PENTAHYDRO-PERFLUOROALKYL DERIVATIVES, THEIR PRODUCTION AND USE

Atsuo Katsushima, Higashiosaka; Iwao Hisamoto, Suita; Shoshin Fukui, Toyonaka; Chiaki Maeda, Settsu; Akitoshi Iwatani, Yao; Takahisa Kato, Settsu; Masayuki Nagai, Settsu; Hiroyuki Shinkai, Settsu, and Masayuki Asaoka, Kyoto, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

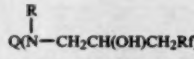
Continuation-in-part of Ser. No. 538,507, Jan. 6, 1975, Pat. No. 4,084,059, which is a division of Ser. No. 299,741, Oct. 24, 1972, Pat. No. 3,870,748, which is a continuation-in-part of Ser. No. 877,497, Nov. 17, 1969, abandoned. This application Jun. 16, 1977, Ser. No. 807,164

Claims priority, application Japan, Nov. 18, 1968, 43-84276; Dec. 5, 1968, 43-89252; Dec. 19, 1968, 43-93513; Dec. 19, 1968, 43-93514; Feb. 7, 1969, 44-9524; Mar. 10, 1969, 44-18411

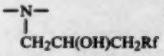
Int. Cl.[2] C07C *91/04, 91/06, 91/14, 91/26*

U.S. Cl. 260—584 R **9 Claims**

1. A compound of the formula:



wherein Q is a hydrogen atom, $—CH_2CH(OH)CH_2Rf$ or a hydrocarbon residue having a valence corresponding to m which may contain one or more of —O—, —COO—, —NH—, —N= and



in the chain, R is a hydrogen atom, a hydrocarbon residue or $—CH_2CH(OH)CH_2Rf$ and m is an integer of not less than 1, Rf being a perfluoroalkyl group, an ω- hydro-perfluoroalkyl group or an ω-chloro-perfluoroalkyl group having 4 to 20 carbon atoms.

4,165,339

CATALYTIC ALDOL CONDENSATIONS

Walter T. Reichle, Warren, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 745,809, Nov. 29, 1976, Pat. No. 4,086,188, which is a continuation-in-part of Ser. No. 657,568, Feb. 12, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,175

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—586 C **11 Claims**

1. In the method for the aldol condensation of active hydrogen containing compounds the improvements comprising contacting said active hydrogen containing compounds containing 0 to about 20 percent by weight of water with a catalyst prepared by the steps of:

(a) interacting stoichiometric amounts of a water-soluble salt of a metal of the Group II of the Deming Periodic Table and a water-soluble aluminum salt with a stoichiometric amount of an alkali metal or alkaline earth metal, water-soluble hydroxide in water to precipitate a water-insoluble slurry of mixed hydroxides with the proviso that the ratio of gram atoms of aluminum metal to Group II metal is in the range of about 0.02 to about 0.3;

(b) washing the slurry from step (a) with water until substantially free from water-soluble salts;

(c) contacting the washed slurry from step (b) with a dilute aqueous solution of a lithium or zinc salt at ambient temperatures; and

(d) recovering and drying the product of step (c) at a temperature below about 400° C.

4,165,340

PROCESS FOR PREPARING HEXAFLUOROPROPANONE-2

Takashi Tohzuka, and Yohnosuke Ohsaka, both of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 19, 1977, Ser. No. 826,248

Claims priority, application Japan, Aug. 23, 1976, 51-100831; May 23, 1977, 52-59590

Int. Cl.[2] C07C 45/04

U.S. Cl. 260—593 H 1 Claim

1. A process for preparing hexafluoropropanone by a one step reaction which comprises contacting hexafluoropene and oxygen in a molar ratio of 1:10–0.1 at a temperature from about 80° to 300° C. and in the presence of water in an amount of from about 0.001 to 0.03 mole per mole of hexafluoropropene, with

(a) a fluorinated alumina catalyst, having a fluorine content from about 0.5 to 50% by weight, or

(b) a fluorinated silica-alumina catalyst having a fluorine content from about 0.5 to 505 by weight.

4,165,341

PROCESS FOR PREPARING PROTOCATECHUALDEHYDE AND ITS DERIVATIVES

Sumio Umemura; Nagaaki Takamitsu; Takuji Enomiya; Hiroshi Shiraishi, and Takato Nakamura, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

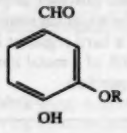
Filed Jan. 16, 1978, Ser. No. 869,608

Claims priority, application Japan, Feb. 4, 1977, 52/10733; May 10, 1977, 52/52590

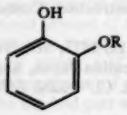
Int. Cl.[2] C07C 45/18

U.S. Cl. 260—600 R 8 Claims

1. An improved process for preparing protocatechualdehyde or a 3-alkoxy-4-hydroxybenzaldehyde represented by the formula



wherein R represents a methyl group or an ethyl group, which comprises reacting catechol or a 2-alkoxyphenol represented by the formula



with glyoxylic acid in a basic aqueous medium to form a reaction product, and then oxidizing said reaction product in a basic aqueous medium,

the improvement comprising reacting said catechol or said 2-alkoxyphenol with glyoxylic acid in the range of 0.5–2 moles per mole of catechol or a 2-alkoxyphenol, in an aqueous medium containing a strong inorganic base and at least one catalyst selected from the group consisting of aluminum oxide, silicon oxide and hydrated aluminum oxide in an amount of not less than 0.01 g. per 1 g. of the starting catechol or 2-alkoxyphenol at a temperature of 0° to 50° C. to form said reaction product.

4,165,342

PREPARATION OF 3-ALKYL-BUTEN-1-ALS

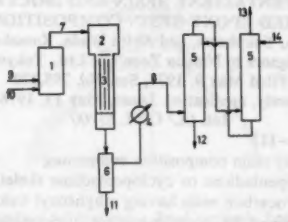
Christian Dudeck, Limburgerhof; Hans Diehm, Mannheim; Fritz Brunnmueller, Ludwigshafen; Bernd Meissner, Heidelberg, and Werner Fliege, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,785

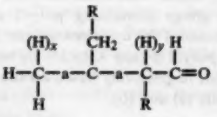
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2715209

Int. Cl.[2] C07C 45/16

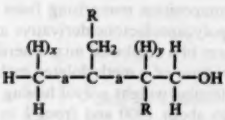
U.S. Cl. 260—603 C 15 Claims



1. A process for the preparation of 3-alkyl-buten-1-als of the formula



where the individual radicals R may be identical or different and each is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and alkyl of 1 to 5 carbon atoms substituted by alkyl or alkoxy each of 1 to 4 carbon atoms, one of the two radicals a is a double bond and the other is a single bond between the respective adjacent carbon atoms, and x and y are different and are each 0 when the adjacent symbol a is a double bond and 1 when the adjacent symbol a is a single bond, which comprises reacting at from 320° to 650° C. a 3-alkyl-buten-1-ol of the formula



where R, x, y and a have the above meanings, with oxygen in the presence of a catalyst of total thickness from 5 to 35 mm, said catalyst containing at least 2 layers of crystals selected from the group consisting of silver crystals, copper crystals and mixtures thereof, one part of the layers containing from 10 to 50 percent by weight of the catalyst and having particles of sizes from 0.75 to 2.5 mm, and the remaining part of the layers containing from 50 to 90 percent by weight of the catalyst and having particles of sizes from 0.2 to 0.75 mm.

4,165,343

DEHYDRATION OF TERTIARY BUTYL ALCOHOL

Ralph Levine, Freehold, and Jerome R. Olechowski, Lawrenceville, both of N.J., assignors to Cities Service Conmpany, Tulsa, Okla.

Filed Jul. 28, 1978, Ser. No. 929,075
Int. Cl.[2] C07C 5/22
U.S. Cl. 585—638 10 Claims

1. A process for dehydrating t-butyl alcohol to isobutylene which comprises contacting the t-butyl alcohol with a liquid sulfonic acid catalyst in the presence of a xylene at a temperature of 70°-200° C. in a reaction zone.

4,165,344

CYCLOPENTADIENE RESIN AND ISOCYANATE CURED EPOXY RESIN COMPOSITIONS

Takao Okuda, Yokohama, and Akira Wada, Kamakura, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed May 9, 1977, Ser. No. 795,370
Claims priority, application Japan, May 17, 1976, 51-56375
Int. Cl.[2] C08L 63/00
U.S. Cl. 525—111 14 Claims

1. An epoxy resin composition comprising

(a) a cyclopentadiene or cyclopentadiene skeleton-containing hydrocarbon resin having a hydroxyl value of 100 to 300 obtained by copolymerizing cyclopentadiene or a cyclopentadiene skeleton-containing monomer and a hydroxyl-containing monolefinic monomer at elevated temperatures,

(b) a polyol selected from the group consisting of epoxy resins containing at least two hydroxyl groups in the molecule and epoxy resin derivatives containing at least two hydroxyl groups in the molecule and obtained by the reaction of epoxy resins with alkanolamines, and

(c) an isocyanate group containing polyol curing agent wherein the amounts of the cyclopentadiene hydrocarbon resin (a) and the polyol (b) are 90 to 5% by weight, and 10 to 95% by weight, respectively based on the total weight of the components (a) and (b).

4,165,345

HIGH SOLIDS COATING COMPOSITIONS

Oliver W. Smith, South Charleston, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 690,185, May 26, 1976, Pat. No. 4,101,603. This application Apr. 20, 1978, Ser. No. 898,103
Int. Cl.[2] C08L 61/32, 67/04; C08G 18/64
U.S. Cl. 525—419 17 Claims

1. A high solids composition comprising from (I) 20 to 80 weight percent of a polycaprolactone derivative and (II) from 80 to 20 weight percent of a combined mix; wherein said combined mix (II) is a mixture of a methylolated melamine and a non-volatile low molecular weight polyol having a molecular weight of from 62 to about 1000 and from 2 to 6 hydroxyl groups wherein the methylolated melamine comprises from 40 to 90 weight percent of said combined mix; and wherein said polycaprolactone derivative (I) is a carboxyl modified polycaprolactone urethane adduct reaction product mixture of (i) a polycaprolactone polyol, (ii) from 0.025 to 0.9 isocyanato equivalent for each initial hydroxyl equivalent present in the polycaprolactone of an organic polyisocyanate and (iii) from 0.1 to 1 carboxylic anhydride equivalent per each unreacted hydroxyl equivalent present of an intramolecular anhydride of a polycarboxylic acid.

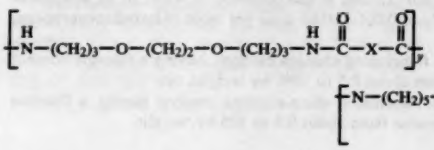
4,165,346

COPOLYMER OF POLY(4,7-DIOXADECAMETHYLENE ADIPAMIDE)-POLYCAPROLACTAM CONTAINING TEREPHTHALIC ACID

Robert M. Thompson, Wilmington, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 745,318, Nov. 26, 1976, abandoned. This application Sep. 25, 1978, Ser. No. 945,363
Int. Cl.[2] C08L 77/00
U.S. Cl. 525—432 2 Claims

1. A block copolymer having a molecular weight of about 5000–100,000 and the following repeating structural formula:



wherein X consists essentially of the bivalent radical $-(CH_2)_4-$ and the bivalent paraphenylene radical, the latter being present in minor amount sufficient to eliminate fiber fusion when the copolymer is scoured in boiling water, but not greater than about 13 weight percent of the total bivalent radical X and

y=4–200

z=4–200.

4,165,347

THERMOPLASTIC IONIC POLYMER COMPOSITIONS

Richard G. Bauer, Kent, and Diego C. Rubio, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 29, 1978, Ser. No. 920,428
Int. Cl.[2] C08L 9/00, 47/00
U.S. Cl. 525—69 5 Claims

1. A thermoplastic ionic polymer composition composed of 10 to 90 weight percent of a soft segment ionic polymer and 90 to 10 weight percent of a hard segment ionic polymer reacted with at least 10% to 100% of a metal ion based on the amount of free acid in said composition.

4,165,348

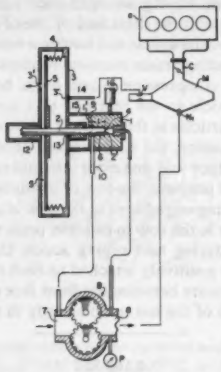
APPARATUS FOR FUEL SUPPLY TO SPARK IGNITION TYPE INTERNAL COMBUSTION ENGINE

Rinjiro Nakamura, Tokyo, Japan, assignor to Chiyoda Chemical Engineering and Construction Company Ltd., Yokohama, Japan

Filed Aug. 12, 1977, Ser. No. 824,307
Claims priority, application Japan, Aug. 26, 1976, 51/101061
Int. Cl.[2] F02M 7/20
U.S. Cl. 261—36 A 12 Claims

1. A pressure adjusting device for a fuel supply apparatus for a spark ignition type of internal combustion engine, said apparatus comprising: a cylinder, a piston slidable in said cylinder, said cylinder having an inlet opening into the inner end thereof for admitting liquid fuel from the discharge side of a fuel pump, said piston and cylinder having a small gap therebetween extending along a portion of the length thereof with the length of the gap being varied during motion of the piston in and out of the cylinder, said cylinder having an outlet therefrom at the end of the gap remote from the inlet for discharging liquid fuel passing through said gap to the intake side of a fuel pump, a bellows at the opposite end of said piston from said gap and having a bellows plate attached to the said opposite end of said

piston, the space outside of said bellows being open to the atmosphere, and means connected to said bellows for communicating the interior of the bellows with the static pressure of a Venturi throat in the air intake of the fuel supply apparatus.

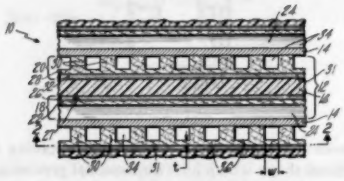


4,165,349

METHOD FOR FABRICATING A RIBBED ELECTRODE SUBSTRATE

Gregory J. Sandelli, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 15, 1977, Ser. No. 824,758
Int. Cl.[2] B29C *25/00*; C01B *31/02*
U.S. Cl. 264—29.1 **1 Claim**



1. A method for fabricating a porous one piece fuel cell electrode substrate having a flat surface on one side and ribs on the other side thereof, said ribs forming U-shaped channels therebetween extending across said substrate, comprising the steps of:

preparing a uniform, dry mixture comprising about 20% phenolic resin, by weight, and about 80% carbon fibers, by weight, the fibers being less than 50 mils in length;

loading a predetermined amount of the mixture into a molding die having the mirror image of the rib pattern desired in the substrate by sifting said mixture into said die through a screen, the amount of mixture being just sufficient to provide the finished part with a preselected porosity of at least 75% after pressing, and distributing the mixture uniformly throughout the die;

simultaneously pressing the mixture in the die to the desired thickness of the substrate and heating the mixture to above the melt point of the resin but to less than the final cure temperature of the resin and holding the pressure and temperature at least until the resin cures to an extent such that it retains its pressed shape after release of the pessure;

fully curing the pressed part;

heat treating the fully cured part up to at least 2100° C. in an inert atmosphere to convert the resin to glassy carbon; and

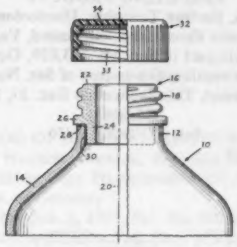
impregnating the entire flat surface of the heat treated part with a wetproofing material except at select locations uniformly distributed under the ribs, said impregnating being to a depth of at least about the thickness of the substrate between the ribs.

4,165,350

FIRED CERAMIC BOTTLE HAVING THREADED NECK AND METHOD OF MAKING SAME

Jerome S. Greenberg, Chicago, Ill., assignor to Regal China Corporation, Antioch, Ill.

Division of Ser. No. 525,813, Nov. 21, 1974, Pat. No. 4,014,448. This application Dec. 23, 1976, Ser. No. 753,782
Int. Cl.[2] C04B *33/34*
U.S. Cl. 264—60 **10 Claims**



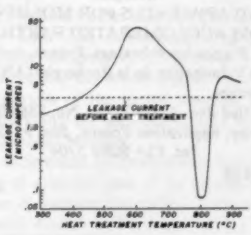
1. The method of making a fired ceramic bottle having a threaded neck comprising molding said bottle with an opening therein in plaster molds from a clay slip; separately forming an adaptor having an opening therethrough and external threads thereon by pressing a vitrifiable material under sufficient pressure in a mold to form a handleable piece, the outer sealing surface of said adaptor being in a plane substantially perpendicular to the axis of said threads, said perpendicular relationship between the plane of said outer surface of the axis of the said threads being sufficiently accurate to insure liquid tight sealing of said outer surface against the sealing element of a threaded cap; applying said adaptor to said bottle with the opening in said adaptor communicating with the opening in said bottle, and firing said adaptor and bottle to integrate them into a single unitary ceramic piece.

4,165,351

METHOD OF MANUFACTURING A METAL OXIDE VARISTOR

John E. May, Skaneateles, N.Y., assignor to General Electric Company, Auburn, N.Y.

Continuation of Ser. No. 616,855, Sep. 25, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,633
Int. Cl.[2] C04B *33/32*
U.S. Cl. 264—66 **33 Claims**



1. A method for making metal oxide varistor bodies comprising:

combining a zinc oxide base material with a small amount of a plurality of preselected additives in particulate form to

provide a final mixture, at least one of said additives being bismuth oxide;

pressing and sintering a portion of such final mixture to provide a fused body;

heat treating said fused body after said sintering by maintaining said body at a temperature of between about 750° C. and 1200° C. for a time of at about ten hours or more to significantly reduce the leakage current as well as to increase the alpha of said body.

4,165,352

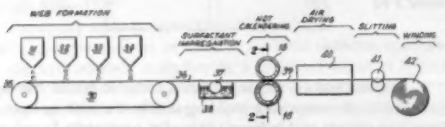
METHOD OF PRODUCING SELF-BONDED, MELT-BLOWN BATTERY SEPARATORS, AND RESULTING PRODUCT

Roy G. Volkman, Rariton Township, Hunterdon County, N.J., assignor to James River Corp., Richmond, Va.

Continuation-in-part of Ser. No. 733,029, Oct. 18, 1976, abandoned, and a continuation-in-part of Ser. No. 267,420, Jun. 29, 1972, abandoned. This application Dec. 21, 1977, Ser. No. 862,843

Int. Cl.[2] B04H *1/16*

U.S. Cl. 264—113 **7 Claims**



1. A method of producing battery separator web stock for cutting into battery separators having a wetability property, comprising

(a) forming a continuous, moving multi-ply web of at least three plies of melt-blown, randomly laid thermoplastic resin fibers, wherein said plies are each separately formed one upon the other as outer plies and a central ply, each ply during formation thereof being bonded to an adjacent ply to a degree by mechanical and thermal self-bonding, said central ply fibers having an average diameter of 2–10 microns, said outer ply fibers having an average diameter of 30–40 microns,

(b) saturating said moving web with a solution of a surfactant dissolved in a volatile solvent,

(c) passing said saturated web between rotating opposed heated calendering rolls to reshape said web, to mechanically disperse said solution throughout said web and to heat and rapidly evaporate said solvent,

(d) passing said web through a drying means to remove any remaining solvent, and

(e) slitting said web to a size suitable for cutting into battery separators having a wetability property.

4,165,353

METHOD AND APPARATUS FOR MOLDING ARTICLES FROM AGGLOMERATED PARTICLES

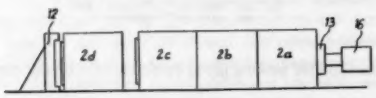
Pierre Sorbier, Pernes-les-Fontaines, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Jan. 3, 1977, Ser. No. 756,000

Claims priority, application France, Jan. 9, 1976, 76 00525

Int. Cl.[2] B29J *5/04*

U.S. Cl. 264—120 **4 Claims**



1. In the method of manufacturing articles from agglomerated particles which comprises the steps of preparing batches of particles, delivering the batches one by one to a press comprising a chamber having an open face against which one temporarily maintains the front face of one of a series of molds adapted to receive the article and having a rear face adapted to press a corresponding article received in another of said molds, carrying out the compression in said press, bringing the mold containing its article to the rear end of a row of molds, and maintaining the articles in the molds in the row under pressure during polymerization, the improvement according to which, in order to introduce said one mold into said row and to obtain and maintain said pressure, the row of molds is held in position, said one mold being introduced to the row is urged against the last mold already in the row in order to press the article in said one mold, and during said urging action the two last-mentioned molds are positively attached to each other to keep aid article under pressure between the front face of said one mold and the rear face of the last mold already in the row.

4,165,354

PROCESS FOR PRODUCING PLASTIC PIPES HAVING OVAL CROSS-SECTIONAL SHAPE

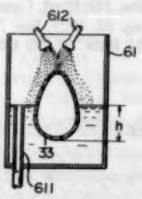
Noboru Iida, Ohtsu, Japan, assignor to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 15, 1977, Ser. No. 824,953

Claims priority, application Japan, Aug. 19, 1976, 51-99403

Int. Cl.[2] D01D *5/08, 5/24*

U.S. Cl. 264—178 R **6 Claims**



1. A process for producing a plastic pipe having an oval cross-sectional shape with a high dimensional precision, which comprises conducting a roughly shaped plastic pipe having an oval cross-sectional shape, which is in the softened state and composed of a large-diameter portion, a small-diameter portion and transitional portions connecting them to each other, to a cooling tank while its shape is adjusted by being passed through a forming tube with its large-diameter portion down; cooling the form-adjusted plastic pipe in the cooling tank by dipping the large-diameter portion or both the large diameter portion and a part of the transitional portions contiguous thereto in a cooling bath; and subjecting that portion of the form-adjusted plastic pipe which is out of the cooling bath to a shower of a cooling liquid.

4,165,355

METHOD FOR MANUFACTURE OF A SUBSTANTIALLY MECHANICALLY ISOTROPIC CERAMIC COMPOSITE STRUCTURE

Thomas Vasilos, Winthrop, Mass., assignor to Avco Corporation, Wilmington, Del.

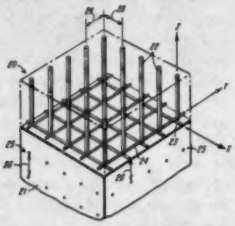
Filed Apr. 28, 1978, Ser. No. 901,197

Int. Cl.[2] C04B *35/64*

U.S. Cl. 264—255 **10 Claims**

1. A method of amking a substantially mechanically isotropic ceramic structure comprising the steps of, supporting a plurality of straight elongate rigid reinforcing Z members in parallel relation in a Z direction, providing a first controlled thickness of a sinterable powder material along said Z members, said powders being characterized as having a compres-

sion ratio of up to 5, disposing a plurality of substantially straight elongate reinforcing X members and Y members along said Z members and in contact with said powder material with each of said X and Y members being disposed along an associated one of an X and Y direction, providing a second controlled thickness of said powder material along said Z members, and hot pressing said powder material and members in the temperature range of 1450° C. to 1600° C. and pressure exerting pressure parallel to said Z members to define a hot pressed structure consisting of said powder material which has been substantially pressed and sintered to define a matrix which has said reinforcing members embedded therein and thus define said structure.

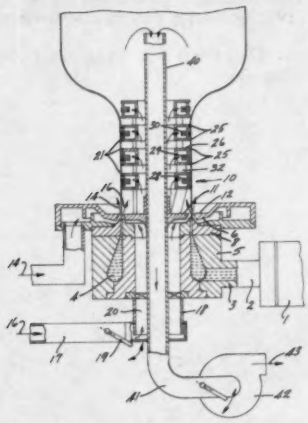


4,165,356

METHOD OF FORMING TUBULAR PLASTIC MATERIAL HAVING A FLARE-TOP EDGE USING A BLOW HEAD

James E. Heider, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 15, 1978, Ser. No. 905,713
Int. Cl.[2] B29D *23/04*
U.S. Cl. 264—519 **6 Claims**



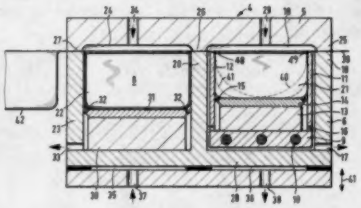
1. In a method of forming extruded tubular thermoplastic film to create a permanent inherent flaring characteristic of the severed edges of the tubular film when flattened and lying in face-to-face two-ply relation, wherein a series of internal annular nozzles is employed to cool the film internal surface with a gaseous medium and form continuous skin layers thereon and wherein the film during formation by streatching is maintained out-of-contact with said internal annular nozzles, the improvement which comprises the steps of directing a plurality of radial streams of cooling gaseous medium from said series of internal annular nozzles forcefully against the interior surface of the extruded tubular film as formed closely adjacent the melt issuing extruder, controlling the removal of the internal cooling gaseous medium from the interior of the extruded tubular film and through the extruder to thereby control the internal pressure and precise dimensions of the extruded tubular film as formed, directing one or more radial streams of heated gaseous medium forcefully against the exterior surface of the extruded tubular film as formed closely adjacent the melt issuing extruder, the cooling and heated gaseous mediums being juxtaposed at least in part and simultaneously applied in facing relation to create a substantial temperature differential between the interior and exterior surfaces of the extruded tubular film as formed to thereby establish different physical characteristics in said surfaces and a permanent flaring tendency at its edges when flattened and subsequently severed.

4,165,357

METHOD OF SHAPING PLASTICS FOILS

Arthur Vetter, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Wolfertschwenden, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,104
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 7638759[U]
Int. Cl.[2] B29C *17/04*
U.S. Cl. 264—548 **6 Claims**



1. A method for vacuum-forming from a thin-film thermoplastic material a container of the type having at least one sidewall which joins a bottom surface along at least one junction, said method comprising the steps of:

providing a mould member having an edge portion, at least one sidewall portion, and a bottom portion which together define a mould cavity with a configuration complementary to that of the container,

heating said mould member to a temperature above the deformation temperature of the thermoplastic material,

placing a sheet of the thermoplastic material with a temperature less than its deformation temperature over the mould member cavity,

and applying a pressure differential across the thermoplastic material to draw said thermoplastic material into said cavity to effect progressive contact between the heated mould member and the thermoplastic material starting at said edge portion of the mould member and extending downwardly along the sidewall thereof toward the bottom of said mould member,

said pressure differential application step further resulting in the heating of a central part of the bottom portion of the container as it contacts the mating portion of the mould member, with further deformation of the thermoplastic material occurring outwardly from said central part toward said junction of said sidewall and bottom portions,

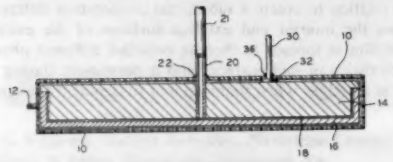
whereby the thermoplastic material is progressively heated and deformed as it progressively contacts the surfaces of the mould member.

4,165,358

PROCESS FOR CLAMPING, SEALING, AND AIDING THE FILLING OF MATCHED MOLDS

Jay Johnson, 3225 N. Verdugo, Glendale, Calif. 91208

Filed Apr. 12, 1978, Ser. No. 895,639
Int. Cl.[2] B29F *1/00*
U.S. Cl. 264—571 **6 Claims**



1. A method of clamping, sealing, and aiding the filling of low pressure matched molds, said method comprising the steps of:

placing an air-impervious bag about the matched mold parts;

sealing said bag about said molds;

producing a vacuum within said bag in a manner such as to fix said molds firmly together; and

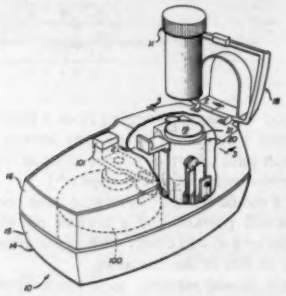
injecting a predetermined amount of molding material within said molds.

4,165,359

AUTOCLAVE ASEPTOR

Michael D. Thomas, Elmhurst, and Francis E. Ryder, Barrington, both of Ill., assignors to Ryder International Corporation, Schaumburg, Ill.

Filed Dec. 4, 1975, Ser. No. 637,514
Int. Cl.[2] A61L *3/00*
U.S. Cl. 422—105 **1 Claim**



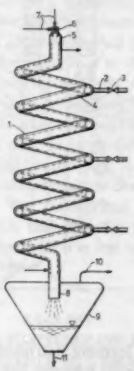
1. An autoclave sterilizer for contact lenses, comprising in combination: a capsule of predetermined size and shape for housing said lenses and providing a vapor tight chamber in which said lenses and a sterilizing solution may be placed; a housing unit for receiving said capsule, said housing unit including; an exterior casing; a thermally conductive heat well structure disposed within said casing and including an interior well shaped to receive and to surround closely said capsule to maximize the transmission of heat from said heat well structure to said capsule; heater means for said heat well structure including a heating element engaged in an outer well structure wall portion at a first exterior location, said heating element being in abuting, heat transfer engagement with said heat well structure for the direct and conductive application of heat thereto; a thermostat device in operative engagement with said heat well structure at a second, exterior location to sense the temperature of said heat well structure at said location, said thermostat device being operatively associated with said heater means to deactivate same once a predetermined temperature is reached at said second exterior location, which predetermined temperature is in excess of the boiling temperature of the sterilizing solution to be placed in said capsule, when at atmospheric pressure; timing means for controlling the length of the sterilizing operation; a cover member pivotly connected to said casing for overlying said interior well and said capsule disposed therein; thermally activated latch means including a bimetallic strip having an end portion mounted in direct heat conductive engagement with said heat well structure at a third exterior location; a latch member carried by the opposite end of said bimetallic strip for selective mechanical engagement with said cover to latch said cover in place and preclude access to the interior well and capsule when said heat well structure is above a second predetermined, lock activating temperature which is lower than said first mentioned predetermined temperature and at a level to insure the safety of the user; said second location at which said thermostat device is mounted being disposed on an opposite side of said interior well with respect to said first location at which said heater element is in engagement with said well thereby insuring the heating of said well to the first mentioned predetermined temperature prior to the operation of said thermostat device to deactivate said heater means, and said third location at which said bimetallic strip is mounted, being intermediate said first and second locations to provide for the rapid transfer of heat to said bimetallic strip to insure the engagement of said latch to said cover prior to any portion of said heat well structure reaching said first predetermined temperature.

4,165,360

MULTI-PHASE FLOW TUBE FOR MIXING, REACTING AND EVAPORATING COMPONENTS

Clemens Casper, Krefeld; Axel Lippert, Krefeld-Verberg, and Johannes O. Sajben, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1977, Ser. No. 829,367
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719956
Int. Cl.[2] B01F *5/20*; B01D *1/22*; B01J *10/00*; F28D *7/02*
U.S. Cl. 422—202 **3 Claims**



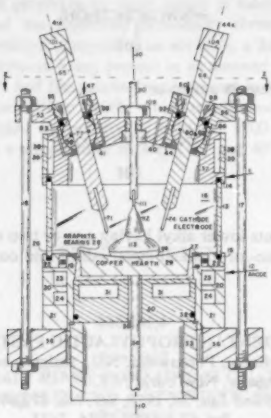
1. An apparatus for mixing, reacting and/or evaporating components in a multi-phase flow tube, comprising a helically wound tube having an entrance end and an exit end, having a feed pipe in the entrance end of the tube and a separation vessel at the exit end of the tube, the helically wound tube being surrounded by a tempering jacket divided into sections, and one or more conduits, said conduits opening in the tube and projecting through the tempering jacket, through the tube wall and beyond the internal surface of the tube wall, arranged along the axis of the helically wound tube.

4,165,361

PROCESS AND APPARATUS FOR PREPARATION OF SINGLE CRYSTALS AND TEXTURED POLYCRYSTALS

Joseph B. Milstein, 1110 Downs Dr., Silver Spring, Md. 20904

Division of Ser. No. 635,421, Nov. 28, 1975, Pat. No. 4,087,313.
This application Feb. 15, 1978, Ser. No. 877,594
Int. Cl.[2] B01J *17/18*
U.S. Cl. 422—249 1 Claim



1. In combination with an electric arc powered crystal growing apparatus, of the type wherein:

a material is placed in an electrically conductive hearth, the material is then partially melted by the action of a plurality of electric arcs and plasma associated with each such arc to produce a molten region contained by the solid portion of said material, and then a crystal is grown by controlled withdrawal of material from the molten region, wherein the improvement comprises:

a replacement for the conductive hearth having as its parts:

a hearth of copper metal,

a graphite bearing in which the hearth is supported, which conducts electrical current and heat from the hearth to the unaltered portion of the apparatus, and in which the hearth is capable of rotation, and

means for causing rotation of the hearth relative to the said electric arcs, during the operation of the apparatus such that the action of the arcs removes dross from the surface of the molten region.

4,165,362

HYDROMETALLURGICAL PROCESSING OF MOLYBDENITE ORE CONCENTRATES

Victor R. Reynolds, Weston, Conn., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Continuation of Ser. No. 786,101, Apr. 8, 1977, abandoned. This application Apr. 13, 1978, Ser. No. 896,106
Int. Cl.[2] C01G *39/00*
U.S. Cl. 423—53 11 Claims

1. In a process for the conversion in a reaction zone of a molybdenum disulfide to molybdic trioxide by maintaining an agitated aqueous liquid slurry of particles of molybdenum disulfide-bearing material at a temperature in the range of from about 150° to about 230°0 C. in contact with gaseous molecular oxygen having a partial pressure in the reaction zone in the range of from about 50 to about 500 psi for a period of time sufficient to effect conversion of molybdenum disulfide to molybdic trioxide and thereafter recovering product solid molybdic trioxide from said slurry, the improvement of adding to said reaction zone in the range of from about 0.12 to about 1.68 mols of a strong hydroxide per mol of molybdenum disulfide and continuing said conversion reaction until the pH of said slurry is in the range of from about 0.05 to about 0.5 and thereafter separating from said slurry a solids fraction containing predominantly molybdic trioxide.

4,165,363

PROCESS FOR THE PRODUCTION OF CHLOROSILANES

Wolfgang Weigert, Offenbach; Eugen Meyer-Simon, Frankfurt, and Rudolf Schwarz, Wasserlos, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jan. 31, 1973, Ser. No. 328,362
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1972, 2209267
Int. Cl.[2] C01B *33/08*
U.S. Cl. 423—342 12 Claims

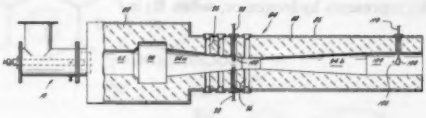
1. A process of producing hydrogen containing chlorosilanes in which silicochloroform is the predominant chlorosilane formed consisting essentially of reacting $SiCl_4$ with H_2 in the presence of activated carbon catalyst at 600° to 1200° C. with a residence time in the reaction zone of 0.5 to 20 seconds to form a reaction equilibrium mixture containing $SiCl_4$, H_2, $SiHCl_3$ and HCl and activated carbon in which process the molar ratio of $SiCl_4/H_2$ is between 1:1 and 1:50, then quenching the reaction mixture to below 300° C., in less than 1 second and then separating the $SiHCl_3$ formed from the reaction mixture.

4,165,364

CARBON BLACK REACTOR WITH AXIAL FLOW BURNER

Robert E. Dollinger, Bedford; Clinton M. Wright, Odessa, both of Tex., and Theodore A. Ruble, deceased, late of Fort Worth, Tex. (by Eulalia Berry Ruble, executrix), assignors to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.

Division of Ser. No. 711,443, Aug. 4, 1976, Pat. No. 4,077,761.
This application Oct. 31, 1977, Ser. No. 847,159
Int. Cl.[2] C01B *31/02*
U.S. Cl. 423—456 1 Claim



1. A method for producing carbon black in a reactor having a longitudinally extending, generally cylindrical mixing zone, a combustion zone downstream thereof, a reaction zone downstream from said combustion zone, and a quench zone downstream from said reaction zone, said method comprising:

introducing an oxidant gas into said mixing zone and flowing said oxidant gas axially therethrough,

flowing said oxidant gas around a centrally disposed bluff body in said mixing zone to generate turbulence in said oxidant gas stream downstream of said central bluff body,

introducing gaseous fuel into said oxidant gas stream in the area of turbulence generated downstream of said central bluff body to partially admix said fuel and oxidant gas,

flowing said partially admixed fuel and oxidant gas further downstream through said mixing zone and around a peripheral bluff body disposed about the periphery of said mixing zone and spaced axially from said central bluff body,

whereby a second area of turbulence is generated downstream of said peripheral bluff body in which second area of turbulence admixture of said fuel and oxidant gas is completed,

flowing said admixed fuel and oxidant gas into said combustion zone, for combustion therein,

flowing the hot combustion product gases from said combustion zone into said reaction zone,

introducing liquid hydrocarbon feedstock into said hot combustion product gases in said reaction zone,

flowing said combustion product gases and feedstock through said reaction zone while said feedstock is reacted to produce carbon black and then into said quench zone, and

introducing quench water into said quench zone to quench the reaction.

4,165,365

SUBSTITUTED 2H-PYRAN-2,6(3H)-DIONE DERIVATIVES

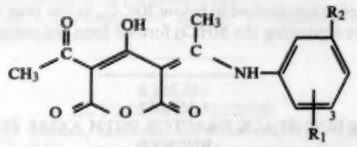
Kenneth M. Snader, Hatboro, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 792,151, Apr. 29, 1977, abandoned. This application Mar. 10, 1978, Ser. No. 885,143

Int. Cl.[2] A61K *31/35;* **A61L** *9/04;* **C07D** *309/16*

U.S. Cl. 424—45 **21 Claims**

1. A compound represented by the formula:



wherein:

R_1 represents —NHCOCH$_2$CH$_2$COOR$_3$, —NHCOCOOH or

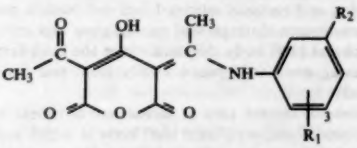
R_2 represents hydrogen or, when R_1 is

also represents amino or

and

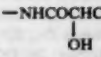
R_3 represents lower alkyl having one or two carbon atoms; or a mono- or di-alkali metal salt of said compound.

20. A method of inhibiting the symptoms of asthma which comprises administering to an animal in need of said inhibition a therapeutically effective amount for producing said inhibition of a compound represented by the formula:

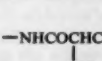


wherein:

R_1 represents —NHCOCH$_2$CH$_2$COOR$_3$, —NHCOCOOH or



R_2 represents hydrogen or, when R_1 is



also represents amino or

and

R_3 represents lower alkyl having one or two carbon atoms; or a mono- or di-alkali metal salt of said compound.

4,165,366

DENTAL PROPHYLACTIC PASTE

James R. Mellberg, Pottersville, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,841

Int. Cl.[2] A61K *7/16, 7/22*

U.S. Cl. 424—49 **11 Claims**

1. A substantially non-aqueous dental prophylactic paste comprising about 40–60% by weight of an abrasive, a humectant, a soluble alkaline silicate and an acid-forming agent selected from the group consisting of anhydrides, amides and esters, the silicate being present in an amount of about 5–10% by weight and the acid forming agent in an amount of about 2–5% by weight.

4,165,367

HAIR PREPARATIONS CONTAINING VINYL PYRROLIDONE COPOLYMER

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jun. 10, 1977, Ser. No. 805,396

Int. Cl.[2] A61K *7/06, 7/11*

U.S. Cl. 424—47 **15 Claims**

1. A hair setting and conditioning composition comprising, approximately by weight,

I. 0.1 to 35% of a film-forming copolymer having a molecular weight of about 15,000 to 1,500,000 and containing

A. about 95 to 45 mole percent of units derived from vinyl pyrrolidone

B. 5 to 50 mole percent of units derived from a monomer of the formula

$$CH_2=CR^1—COOR^2—NR^3R^4$$

wherein

R^1 is H or CH_3,

R^2 is C_{1-20} alkylene, and

R^3 and R^4 are independently C_{1-4} alkyl, and

C. 0 to about 50 mole percent of units derived from at least one ethylenically unsaturated copolymerizable monomer different from A and B,

II. 0.05 to 10% of at least one cosmetically acceptable member selected from the group consisting of organic surface active agents, thickening agents, plasticizers and sequestering agents, in

III. a solvent base selected from the group consisting of water, monohydric C_{2-3} aliphatic alcohols, 1,1,1-trichloroethane, methylene chloride, and mixtures thereof.

4,165,368

DENTAL PROPHYLACTIC PASTE

Maria C. Gaffar, Somerset, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 812,030, Jul. 1, 1977, Pat. No. 4,143,126. This application Dec. 11, 1978, Ser. No. 968,716
Int. Cl.[2] A61K 7/18
U.S. Cl. 424—52 12 Claims

1. A dental prophylactic paste which is substantially non-spattering and has improved flowability through a nozzle under low pressure comprising an abrasive, a humectant and gelatin, the abrasive being present in an amount by weight of about 30–80% and the gelatin being present in an amount by weight of about 0.01 to 10.0%, which is sufficient to impart to said composition a viscosity of between 1200 and 150,000 centipoises at a temperature between 30° and 40° C.

4,165,369

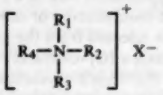
LIQUID HAIR RINSE CONTAINING QUATERNARY AMMONIUM SALTS AND A SYNTHETIC SECONDARY ALCOHOL

Hiroshi Watanabe; Toshihiro Shirose, and Eiji Iijima, all of Chiba, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 713,650, Aug. 12, 1976, abandoned. This application Mar. 30, 1978, Ser. No. 891,755
Claims priority, application Japan, Sep. 11, 1975, 50-110301
Int. Cl.[2] A61K 7/08
U.S. Cl. 424—70 10 Claims

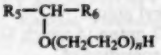
1. A liquid hair rinse composition consisting essentially of

(a) from 0.1 to 10 percent by weight of one or a mixture of quaternary ammonium salts having the formula

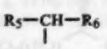


wherein each of R_1, R_2, R_3 and R_4 is alkyl, hydroxyalkyl or benzyl, with the proviso that one or two of R_1, R_2, R_3 and R_4 is alkyl having 8 to 20 carbon atoms or hydroxyalkyl having 8 to 20 carbon atoms and the remainder of R_1, R_2, R_3 and R_4 are alkyl having one to 3 carbon atoms, hydroxyalkyl having one to 3 carbon atoms or benzyl, and X is halide, methylsulfate or ethyl sulfate,

(b) from 0.1 to 10 percent by weight of a synthetic secondary alcohol prepared by oxidizing normal paraffin or an ethoxylate thereof, said alcohol having the formula



wherein n is a number from zero to 7 and



is alkyl having 12 to 18 carbon atoms, and

(c) an amount of a water-miscible organic solvent effective to dissolve components (a) and (b), and

(d) the balance consists essentially of water.

4,165,370

INJECTABLE GAMMA GLOBULIN

Myer Louis Coval, 6241 Chelton Dr., Oakland, Calif. 94611

Division of Ser. No. 688,621, May 21, 1976, Pat. No. 4,093,606, which is a continuation-in-part of Ser. No. 550,467, Feb. 18, 1975, abandoned. This application Apr. 27, 1978, Ser. No. 900,616
Int. Cl.[2] A61K 39/00, 39/42, 37/00; C07G 7/00
U.S. Cl. 424—85 3 Claims

1. A gamma globulin suitable for intravenous administration prepared according to the following process:

a process for preparing a gamma globulin substantially devoid of anticomplementary activity and suitable for intravenous administration, from a material selected from the Fraction II+III plasma protein paste having a protein content of about 25—30% and Fraction II paste which comprises the steps:

a. suspending said paste in water to form a solution of low ionic strength having a conductance of about $300-10^{-6}cm^{-1}ohm^{-1}$ at a pH of about 4.8 to 6.5 to produce a precipitate and a filtrate,

b. fractionally precipitating impurities from said filtrate by adding polyethylene glycol to 4% weight/volume and then 5% weight/volume,

c. precipitating the gamma globulin by adding polyethylene glycol to 12% weight/volume at a pH of about 8.0.

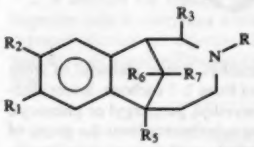
4,165,371

1,2,3,4,5,6-HEXAHYDRO-1,6-METHANO-3-BENZAZOCINES

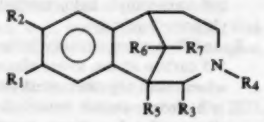
Paul H. Mazzocchi, Lanham, Md., and Aline M. Harrison, Dallastown, Pa., assignors to Research Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,567
Int. Cl.[2] A61K 31/55; C07D 223/32
U.S. Cl. 424—244 17 Claims

1. A compound having in the free base form the formula



or



wherein

R_1 and R_2 are each hydrogen, halogen or non-sterically hindered alkyl of 1–6 carbon atoms, hydroxy, alkoxy of 1–6 carbon atoms, alkanoyl or alkanoyloxy of 2–7 carbon atoms, amino, mono- or dialkylamino wherein each alkyl is of up to 4 carbon atoms and each alkyl is unsubstituted or monosubstituted by hydroxy, chlorine, bromine, trifluoromethyl or amino; or R_1 and R_2 collectively are methylenedioxy or ethylenedioxy;

R_3 is hydrogen or alkoxy of 1–6 carbon atoms;

R_4 is hydrogen, alkyl, alkenyl or alkynyl of up to 6 carbon atoms, cycloalkyl, cycloalkylalkyl, cycloalkylalkenyl, cycloalkenyl or cycloalkenylalkyl, with 3 or 4 carbon atoms in the cyclic group of each, phenyl alkyl or phenylalkenyl of up to 9 carbon atoms which is unsubstituted or monosubstituted by amino alkylamino or dialkylamino each of up to 8 carbon atoms, carbalkoxy, alkoxy, alkanoyl or alkanoyloxy of 1–4 carbon atoms, or by chlorine, bromine, trifluoromethyl cyano or hydroxy;

R_5 is hydrogen, alkyl, alkoxy, alkanoyl or alkanoyloxy of 1–6 carbon atoms, hydrocarbon aryl, alkaryl of 6 or 10 ring carbon atoms and 1–4 alkyl carbon atoms optionally monosubstituted by hydroxy, chlorine, bromine, trifluoromethyl or amino; and

one of R_6 and R_7 is hydrogen, hydroxy, alkyl or alkoxy of 1–4 carbon atoms and the other of R_6 and R_7 is hydrogen, hydroxy, alkyl or alkoxy of 1–6 carbon atoms, hydrocarbon aryl, alkaryl or aralkyl of 6 or 10 ring carbon atoms and 1–4 alkyl carbon atoms, each of which is optionally substituted by 1–3 of hydroxy, halogen or amino.

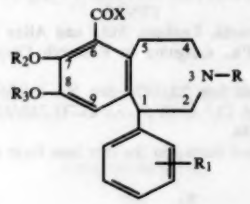
17. A process for alleviating pain in a living animal, which comprises administering a safe and analgesically effective amount of a compound according to claim **1** to a mammal afflicted therewith.

4,165,372
6-CARBOXY-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE COMPOUNDS AND USE AS DOPAMINERGIC AGENTS

Charles K. Brush, Malvern, and Joseph Weinstock, Phoenixville, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 17, 1977, Ser. No. 852,404
Int. Cl.[2] A61K *31/55;* **C07D** *233/16*
U.S. Cl. 424—244 **15 Claims**

1. A chemical compound of the structural formula:



in which:

R is hydrogen, benzyl, phenethyl, lower alkanoyl of from 1–5 carbons, lower alkyl of from 1–5 carbons, lower alkenyl of 3–5 carbons, hydroxyethyl, propargyl or phenacyl;

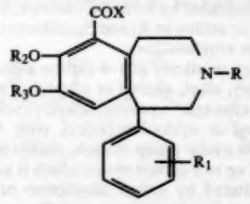
R_1 is hydrogen or one or two substituents from the group of trifluoromethyl, halo, methyl, methoxy, acetoxy, methylthio or hydroxy;

R_2 and R_3 are respectively hydrogen, benzyl, lower alkyl of 1–5 carbon atoms, lower alkanoyl of 2–5 carbon atoms, or when taken together, methylene; and

X is hydroxy, amino, lower alkyl of 1–5 carbons or lower alkoxy of 1–5 carbons; together with pharmaceutically acceptable acid addition or alkali metal salts thereof.

14. The method of producing dopaminergic activity in a subject in need thereof comprising the step of administering orally or parenterally to said subjects a nontoxic amount of a compound of claim **1** which is effective therefor.

15. A chemical compound of the structural formula:



in which:

R is hydrogen, benzyl, phenethyl, lower alkanoyl of from 1–5 carbons, lower alkyl of from 1–5 carbons, lower alkenyl of 3–5 carbons, hydroxyethyl, propargyl or phenacyl;

R_1 is hydrogen or one or two substituents from the group of trifluoromethyl, halo, methyl, methoxy, acetoxy, methylthio or hydroxy;

R_2 and R_3 are respectively hydrogen, benzyl, lower alkyl of 1–5 carbon atoms, lower alkanoyl of 2–5 carbon atoms, or when taken together, methylene; and

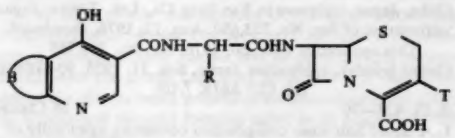
X is hydrogen, chloro or bromo; together with acid addition salts thereof suitable for chemical intermediate use.

4,165,373
7-(α-ACYLAMINO-α-PHENYL OR THIENYLACETAMIDO) CEPHALOSPORIN DERIVATIVES

Hirotada Yamada; Takenari Nakagome, both of Nishinomiya, and Toshiaki Komatsu, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 2, 1977, Ser. No. 773,729
Claims priority, application Japan, Mar. 3, 1976, 51-23482; Mar. 3, 1976, 51-23483; Mar. 3, 1976, 51-23484; Mar. 3, 1976, 51-23485
Int. Cl.[2] C07D *501/20*
U.S. Cl. 424—246 **5 Claims**

1. A compound of the formula:

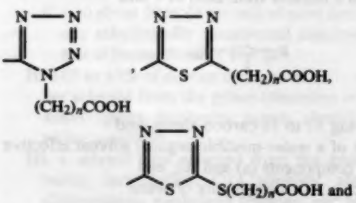


wherein

B represents the non-metallic atoms necessary to complete a pyridine ring, a pyrimidine ring or a pyrazoline ring, each of which may be unsubstituted or substituted with one or more substituents selected from the group consisting of a (C_1–C_4)alkyl group, a (C_1–C_4)alkoxy group, a (C_2–C_5)alkanoyl group, a (C_2–C_5)alkoxycarbonyl group, a (C_1–C_4)alkylthio group, a mercapto group, a hydroxyl group, a (C_2–C_6)alkoxymethyl group, a halogen atom, a cyano group, a nitro group, a (C_1–C_4)alkylsulfonyl group, a phenylsulfonyl group, a pyridylsulfonyl group, a sulfamoyl group, a carbamoyl group, a phenoxycarbonylamino group, an acetoacetylamino group, a (C_1–C_4)alkylamino group, a di-(C_1–C_4)alkylamino group, a halo(C_1–C_4)alkyl group, a (C_2–C_6)alkenyl group, a phenyl group, a pyridyl group and a (C_3–C_6)cycloalkyl group;

R is a phenyl group which can be unsubstituted or substituted with one or more substituents selected from the group consisting of a hydroxy group, an amino group, a hydroxymethyl group, a chlorine atom and a ureido group; or a thienyl group;

T is a $—CH_2S—D$ group in which D is a group selected from the group consisting of



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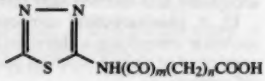


where m and n each is 0 to 3;
and the non-toxic, pharmaceutically acceptable, acid-addition salts thereof.

5. An antibacterial composition which comprises an antibacterially effective amount of a compound of claim 1 as an active ingredient and a pharmaceutically acceptable carrier or diluent.

4,165,374

THIENO[3,2-c]PYRIDINES

Franz Troxler, and Erik Wiskott, both of Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 765,233, Feb. 3, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 922,519
Claims priority, application Switzerland, Feb. 9, 1976, 1530/76; Jul. 29, 1977, 9419/77
Int. Cl.[2] C07D *495/04;* A61K *31/44*
U.S. Cl. 424—256 **35 Claims**

19. A compound of the formula

wherein

R_1^I is hydrogen or alkyl of 1 to 4 carbon atoms, bromine or cyano, in the 2 or 3 position,

R_4^I is alkyl of 4 to 9 carbon atoms, phenyl, phenyl monosubstituted by halogen of atomic number from 9 to 35, phenyl mono-, di- or trisubstituted by alkoxy of 1 to 4 carbon atoms, or a group D^I—COOH, wherein D^I is ethylene, and

R^I is alkyl of 3 to 5 carbon atoms or cycloalkyl of 3, 5, or 6 carbon atoms monosubstituted by alkyl of 1 or 2 carbon atoms.

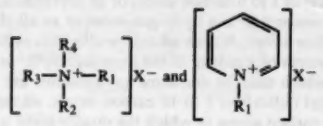
4,165,375

LOW-FOAMING DISINFECTING AGENTS BASED ON QUATERNARY AMMONIUM COMPOUNDS

Hans-Jürgen Berger, Kalletal; Ferdinand Koch; Rolf Scharf, both of Düsseldorf, and Hans-Joachim Schlüssler, Haan, all of Fed Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 2, 1976, Ser. No. 702,230
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 2530584
Int. Cl.[2] A01N *9/00, 9/20, 9/24*
U.S. Cl. 424—263 **8 Claims**

1. A low-foaming disinfecting agent composition for spraying or sprinkling applications consisting essentially of a disinfecting amount of a quaternary ammonium compound having the formula selected from the group consisting of



wherein R_1 is an organic group having 8 to 20 carbon atoms R_2 and R_3 are members selected from the group consisting of alkyl having 1 to 3 carbon atoms and alkylol having 2 to 3 carbon atoms, R_4 is a member selected from the group consisting of alkyl having from 1 to 12 carbon atoms and an aromatic hydrocarbon substituted alkyl having 1 to 12 carbon atoms in the alkyl, optionally substituted in the aromatic hydrocarbon ring with halogen, lower alkyl or lower alkoxy, and X is an anion, from 0.1% to 20% by weight, based on the solids weight of said composition of an alkyl laurate having from 1 to 4 carbon atoms in the alkyl, as a foam inhibitor, and from 0 to 55% by weight, based on the solids weight of said composition, of a sequestering compound counteracting the hardness components of water selected from the group consisting of an alkali metal polymeric phosphate, a phosphonic acid, an alkali metal salt or an ammonium salt of a phosphonic acid, an aminopolycarboxylic acid, and an alkali metal salt or an ammonium salt of an aminopolycarboxylic acid.

4,165,376

TREATMENT OF THE ACUTE AFTER-EFFECTS RESULTING FROM ALCOHOL INGESTION

Carl S. Rosenberg, Chicago, Ill., assignor to Lake Shore Roentgenology, Ltd., Chicago, Ill.

Continuation-in-part of Ser. No. 111,077, Jan. 29, 1971, abandoned. This application Aug. 27, 1975, Ser. No. 608,103
Int. Cl.[2] A61K *31/445*
U.S. Cl. 424—267 **1 Claim**

1. A method for treating the acute after-effects of alcohol ingestion which comprises administering to a person who had ingested alcohol an effective amount of cyproheptadine to minimize an acute inflammatory reaction from alcohol ingestion.

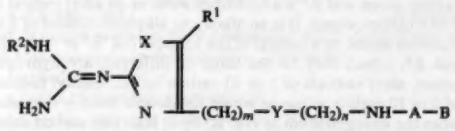
4,165,377

GUANIDINO IMIDAZOLES AND THIAZOLES

Derrick F. Jones, Wilmington, Del., and Tobias O. Yellin, Wallingford, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 19, 1978, Ser. No. 897,910
Claims priority, application United Kingdom, Apr. 20, 1977, 16389/77
Int. Cl.[2] C07D *277/38, 233/88;* A61K *31/425, 31/415*
U.S. Cl. 424—270 **20 Claims**

1. A guanidine derivative of the formula:



in which X is a sulphur atom or NH radical; Y is a direct bond, a methylene radical or a cis- or trans-vinylene radical; m is 0 to 4 and n is 1 to 4; R^1 is a hydrogen or halogen atom or an alkyl radical of 1 to 6 carbon atoms; R^2 is a hydrogen atom, an alkyl radical of 1 to 10 carbon atoms, an alkanoyl radical of 1 to 6 carbon atoms or an aroyl radical of 7 to 11 carbon atoms; A is a 3,4-dioxocyclobuten-1,2-diyl radical or a radical of the formula C=Z in which Z is an oxygen or sulphur atom or a radical of the formula NCN, NNO_2, $CHNO_2$, $NCONH_2$,

$C(CN)_2$, $NCOR^3$, NCO_2R^3, NSO_2R^3 or NR^4 in which R^3 is an alkyl radical of 1 to 6 carbon atoms or an aryl radical of 6 to 12 carbon atoms and R^4 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms; B is an alkoxy or alkylthio radical of 1 to 6 carbon atoms or a radical of the formula NR^5R^6 in which R^5 and R^6, which may be the same or different, are hydrogen atoms, alkyl radicals of 1 to 10 carbon atoms, alkenyl radicals of 3 to 10 carbon atoms in which the double bond is separated from the nitrogen atom of NR^5R^6 by at least one carbon atom, cycloalkyl radicals of 3 to 8 carbon atoms, (primary hydroxy-)alkyl radicals of 2 to 6 carbon atoms in which the oxygen atom is separated from the nitrogen atom of NR^5R^6 by at least two carbon atoms, alkoxyalkyl radicals of 3 to 10 carbon atoms in which the oxygen atom is separated from the nitrogen atom of NR^5R^6 by at least two carbon atoms, alkylaminoalkyl radicals of 3 to 10 carbon atoms in which the nitrogen atom is separated from the nitrogen atom of NR^5R^6 by at least two carbon atoms; or dialkylaminoalkyl radicals of 4 to 10 carbon atoms in which the nitrogen atom is separated from the nitrogen atom of NR^5R^6 by at least two carbon atoms; and the pharmaceutically acceptable acid-addition salts thereof.

18. A pharmaceutical composition to inhibit gastric acid secretion comprising a therapeutically effective amount of a compound of claim **1** to inhibit said secretion in a pharmaceutical carrier.

4,165,378

GUANIDINE DERIVATIVES OF IMIDAZOLES AND THIAZOLES

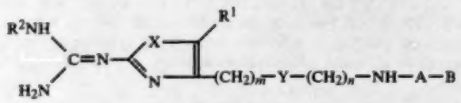
David J. Gilman, Macclesfield; James M. Wardleworth, Wilmslow, both of England, and Tobias O. Yellin, Wallingford, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 19, 1978, Ser. No. 897,912

Int. Cl.[2] **C07D** *277/38, 233/88;* **A61K** *31/425, 31/415*

U.S. Cl. 424—270 **19 Claims**

1. A guanidine derivative of the formula:



in which X is a sulphur atom or NH radical; Y is an oxygen or sulphur atom or a sulphinyl radical; m is 1 to 4 and n is 1 to 4, provided that when Y is an oxygen atom or a sulphinyl radical n is 2 to 4; R^1 is a hydrogen or halogen atom or an alkyl radical of 1 to 6 carbon atoms; R^2 is a hydrogen atom, an alkyl radical of 1 to 10 carbon atoms, an alkanoyl radical of 1 to 6 carbon atoms or an aroyl radical of 7 to 11 carbon atoms; A is a 3,4-dioxocyclobuten-1,2-diyl radical or a radical of the formula C=Z in which Z is an oxygen or sulphur atom or a radical of the formula NCN, NNO_2, $CHNO_2$, $NCONH_2$, $C(CN)_2$, $NCOR^3$, NCO_2R^3, NSO_2R^3 or NR^4 in which R^3 is an alkyl radical of 1 to 6 carbon atoms or an aryl radical of 6 to 12 carbon atoms and R^4 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms; B is an alkoxy or alkylthio radical of 1 to 6 carbon atoms or a radical of the formula NR^5R^6 in which R^5 and R^6, which may be the same or different, are hydrogen atoms, alkyl radicals of 1 to 10 carbon atoms, alkenyl radicals of 3 to 10 carbon atoms in which the double bond is separated from the nitrogen atom of NR^5R^6 by at least one carbon atom, cycloalkyl radicals of 3 to 8 carbon atoms, (primary hydroxy-)alkyl radicals of 2 to 6 carbon atoms in which the oxygen atom is separated from the nitrogen atom of NR^5R^6 by at least two carbon atoms, alkoxyalkyl radicals of 3 to 10 carbon atoms in which the oxygen atom is separated from the nitrogen atom of NR^5R^6 by at least two carbon atoms, alkylaminoalkyl radicals of 3 to 10 carbon atoms in which the nitrogen atom is separated from the nitrogen atom of NR^5R^6 by at least two carbon atoms; or dialkylaminoalkyl radicals of 4 to 10 carbon atoms in which the nitrogen atom is separated from the nitrogen atom of NR^5R^6 by at least two carbon atoms; and the pharmaceutically acceptable acid-addition salts thereof.

17. A pharmaceutical composition to inhibit gastric acid secretion comprising a therapeutically effective amount of a compound of claim **1** to inhibit said secretion in a pharmaceutical carrier.

4,165,379

N-ACETYL THIENAMYCIN

Jean S. Kahan; Frederick M. Kahan, both of Rahway; Robert T. Goegelman, Linden; Edward O. Stapley, Metuchen, all of N.J., and Sebastian Hernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 634,301, Nov. 21, 1975, abandoned. This application Aug. 25, 1977, Ser. No. 827,503

Int. Cl.[2] **C07D** *487/04;* **A61K** *31/40*

U.S. Cl. 424—274 **2 Claims**

1. N-Acetyl thienamycin and pharmaceutically acceptable salts thereof; said N-acetyl thienamycin exhibiting a 100 MHz nmr spectrum characterized by the following peaks: δ 1.27, d, 3H, $J \approx 6.5$; δ 1.98, S, 3H; δ 2.94 m, 2H; δ 3.17, m, 2H; δ 3.38, t, 2H, $J \approx 6.5$; δ 3.38, m, 1H; δ 4.20, m, 2H.

2. An antibiotic composition comprising an effective amount of a compound according to claim **1** and a non-toxic pharmaceutically acceptable carrier therefor.

4,165,380

BIS(SULFIDE)GOLD(1+) SALTS

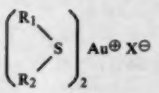
David T. Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 772,034, Feb. 25, 1977, Pat. No. 4,112,113. This application Jun. 2, 1978, Ser. No. 912,137

Int. Cl.[2] **A61K** *31/28;* **C07F** *1/12*

U.S. Cl. 424—290 **4 Claims**

1. A compound of the formula:



in which R_1 and R_2 are 2-hydroxyethyl and X is a weakly nucleophilic anion.

3. A pharmaceutical composition having antiarthritic activity, in dosage unit form, comprising a pharmaceutical carrier and in an amount sufficient to produce antiarthritic activity a compound of claim **1**.

4,165,381

MICROBICIDAL COMPOSITIONS

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

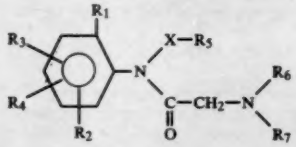
Division of Ser. No. 726,320, Sep. 24, 1976, Pat. No. 4,098,895. This application May 12, 1978, Ser. No. 905,312

Claims priority, application Switzerland, Sep. 30, 1975, 12650/75; Sep. 30, 1975, 12651/75

Int. Cl.[2] **A61K** *31/24;* **C07C** *101/24*

U.S. Cl. 424—309 **12 Claims**

1. A compound of the formula



(I)

wherein

R_1 represents a C_1–C_4-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_2 represents a hydrogen atom, a C_1–C_3-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_3 represents a hydrogen atom, a C_1–C_3-alkyl group or a halogen atom,

R_4 represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R_1, R_2, R_3 and R_4 in the phenyl ring does not exceed 8, and

X represents $-CH_2-$ or

R_5 represents —COOR′, or —COSR′ wherein R′ represents a methyl or ethyl group,

R_6 represents a hydrogen atom or has a meaning assigned to R_7, albeit an independent one,

R_7 represents a C_1–C_6-alkyl group which is unsubstituted or substituted by cyano, hydroxyl or C_1–C_3-alkoxy, or a C_3–C_6-alkenyl group which is unsubstituted or substituted by halogen, or a C_3–C_6-alkinyl or C_3–C_7-cycloalkyl group,

and salts of the compounds of the formula I with inorganic or organic acids.

11. A microbicidal composition which contains as active component a microbicidally effective amount of a compound of the formula I according to claim **1**, together with a suitable carrier therefor.

12. A method of controlling phytopathogenic fungi or of preventing fungus attack, which comprises applying to said plants; part of plants or their environment a fungicidally effective amount of a compound of the formula I according to claim **1**.

4,165,382

METHOD OF PHARMACOLOGICALLY TREATING SCHIZOPHRENIA WITH ALPHA-METHYL-PARA-TYROSINE

Jose Pozuelo, 1463 Burlington, Cleveland Heights, Ohio 44118

Filed Oct. 17, 1977, Ser. No. 842,665

The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 **7 Claims**

1. A pharmacological method of treating schizophrenia in human beings with alpha-methyl-para-tyrosine without causing the formation of alpha-methyl-para-tyrosine crystalluria said method comprising:

administering to a schizophrenic human being a therapeutically effective amount of alpha-methyl-para-tyrosine and an alkalinizing agent, said alkalinizing agent being present in an amount sufficient to cause the urine of said human being to have an alkaline pH.

4,165,383

ANTI-INFLAMMATORY METHOD

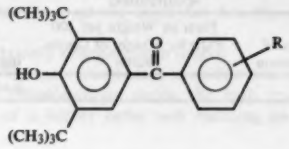
George G. I. Moore, Birchwood, Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 797,173, May 16, 1977, Pat. No. 4,124,725. This application Aug. 25, 1978, Ser. No. 936,763

Int. Cl.[2] A61K *31/12*

U.S. Cl. 424—331 **6 Claims**

1. A method for combatting inflammatory processes in a mammal which comprises administering to said mammal a dose less than the toxic amount but sufficient to inhibit inflammatory processes in said mammal of a compound of the formula



wherein R is hydrogen, 2- or 4-fluoro, alkoxy containing from 1 to 3 carbons, hydroxy or methylthio.

4,165,384

AMIDE SUBSTITUTED PHENOXY PROPANOL AMINES

Enar I. Carlsson, Kungsbacka; Gustav B. R. Samuelsson, Mölnlycke, and Axel K. G. Aberg, Asa station, all of Sweden, assignors to Aktiebolaget Hässle, Gothenburg, Sweden

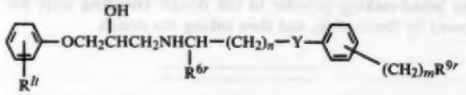
Continuation-in-part of Ser. No. 610,381, Sep. 4, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,290

Claims priority, application Sweden, Nov. 4, 1974, 7413789

Int. Cl.[2] C07C *103/78*

U.S. Cl. 424—324 **6 Claims**

1. A method for treating cardiovascular diseases comprising administering to mammals suffering therefrom a therapeutically effective amount of β receptor blocking agent of the general formula



wherein $R^{1\prime}$ is selected from the group consisting of $-OCH_2CONHCH_2CH_2OH$ and $-OCH_2CONHCH_2CH_2OCH_3$;

$R^{6\prime}$ is selected from the group consisting of hydrogen and alkyl;

$R^{9\prime}$ is selected from the group consisting of hydrogen and $-CONH_2$;

Y is a divalent member selected from the group consisting of O and $-CH_2-$;

n is an integer from 0 to 5 inclusive;

m is an integer from 0 to 2 inclusive;

when $R^{9\prime}$ is hydrogen, m being at least 1; when Y is $-CH_2-$, n is 1 or 2; and alkyl and alkoxy groups, when present, have from 1 to 7 carbon atoms; or a pharmaceutically acceptable salt thereof.

4,165,385

WATER-IN-OIL EMULSION FOR SKIN MOISTURIZING

Elsa G. Lefebvre, Excelsior, Minn., assignor to Dianis Creations, Inc., Minnetonka, Minn.

Continuation of Ser. No. 364,868, May 29, 1973, abandoned. This application Jul. 16, 1975, Ser. No. 596,541

Int. Cl.[2] A61K *47/00*

U.S. Cl. 424—365 **10 Claims**

1. A water-in-oil emulsion comprising water dispersed in an oil phase comprising the following ingredients:

purified cocoa butter,

a liquid triglyceride vegetable oil,

a C_{12}–C_{26} fatty acid ester wax, and mineral oil;

the amounts of said ingredients being defined as follows:

% by Weight of Total Composition	Parts by Weight per 100 Parts by Weight of Cocoa Butter	Ingredient
5–25	—	cocoa butter
30–50	200–400	vegetable oil
3–15	25–100	ester wax
Same as wax	25–100	mineral oil

-continued

% by Weight of Total Composition	Parts by Weight per 100 Parts by Weight of Cocoa Butter	Ingredient
5–25		water

4,165,386

BREAD AND A METHOD OF PRODUCING THE SAME

Iwao Kikuhara, 1516-1, Furumitsu-cho, Matsuyama-shi; Ehime-ken, Japan

Continuation-in-part of Ser. No. 737,381, Nov. 1, 1976, abandoned. This application May 26, 1977, Ser. No. 800,856
Claims priority, application Japan, Nov. 4, 1975, 50/132284
Int. Cl.[2] A21D *2/08*
U.S. Cl. 426—9 4 Claims

4. A method of producing bread, comprising adding at least one kind of rice vinegar containing at least 250 mg/l of free amino acid, said rice vinegar being prepared by mixing a vinegar seed and water with sake which is made by subjecting a mixture of Shubo, steamed rice and koji to alcoholic fermentation while being saccharified, to at least one bread-making powder selected from the group consisting of flour and rye in an amount of between 180 ml and 450 ml relative to 25 kg of the bread-making powder in the dough kneading step, followed by fermenting, and then baking the dough.

4,165,387

METHOD OF BREWING BEER OF IMPROVED STABILITY

Dietrich H. von Wettstein, Vaeløse; Bent Ahrenst-Larsen, Virum; Inga B. Jende-Strid, Allerød, and Jørgen A. Sørensen, Virum, all of Denmark, assignors to De Forenede Bryggerier A/S, Copenhagen, Denmark

Filed Oct. 12, 1976, Ser. No. 731,497
Claims priority, application Denmark, Oct. 15, 1975, 4640/75
Int. Cl.[2] C12C *1/00, 11/04*
U.S. Cl. 426—16 3 Claims

1. In a method of manufacturing beer of acceptable stability and taste wherein wort extracted from barley or malted barley is fermented to produce beer, the improvement which comprises using a strain of barley having a content of less than 20 mg of anthocyanogens per 100 g of dry matter caused by an inherent genetical blocking of the anthocyanogen synthesis in the barley.

4,165,388

TORREFIED BARLEY FOR BREWER'S MASHES

Paul R. Witt, Jr., Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Continuation-in-part of Ser. No. 859,124, Dec. 9, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,719
Int. Cl.[2] C12C *5/00, 7/00, 11/04*
U.S. Cl. 426—16 5 Claims

1. A process for producing torrefied, unmalted barley for use as a malt substitute in a brewer's mash which is used to produce a non-distilled, fermented beverage which comprises heating unmalted barley having a protein content of at least 12% to a temperature sufficient to expand the unmalted barley to the extent that a given volume of barley before heating weighs about 1.4 to 1.75 times the weight of the same volume of barley after heating and recovering the heat-treated barley as said torrefied unmalted barley.

4,165,389

FERMENTATION PROCESS FOR THE PRODUCTION OF A PROTEIN RICH ANIMAL FEEDSTUFF FROM LIQUID DAIRY BY-PRODUCTS

Jean A. du Chaffaut, Neuilly; Claude R. Magnoux, and Patrick L. C. Oberto, both of Lavera, all of France, assignors to The British Petroleum Company Limited, Middlesex, England

Filed Feb. 22, 1978, Ser. No. 880,138
Claims priority, application United Kingdom, Feb. 25, 1977, 08070/77
Int. Cl.[2] A23C *23/00*
U.S. Cl. 426—42 18 Claims

1. A fermentation process for the production of a protein rich animal feedstuff from a liquid dairy by-product containing lactose and lactic acid which comprises cultivating a lactose and lactic acid utilising strain of a yeast of the genus Kluyveromyces in the presence of a gas containing free oxygen in a broth comprising a nitrogen source, the liquid dairy by-product and added nicotinic acid in an amount to give in the broth a minimum of 10 micrograms per gram of lactose and a minimum of 5 micrograms per gram of lactic acid whereby the total quantity of nicotinic acid is present in the broth in a sufficient amount to permit substantial utilization by said yeast of the lactose and lactic acid present.

4,165,390

PROCESS FOR SOLUBILIZING FD&C RED #3 UNDER ACIDIC CONDITIONS AND COMPOSITION

Joseph J. Saladini, Dover, Del.; John V. Parnell, III, Larchmont, N.Y.; Wayne L. Steensen, Newark, and Harry H. Topalian, Dover, both of Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,570
Int. Cl.[2] A23L *1/27*
U.S. Cl. 426—540 16 Claims

1. A process for solubilizing FD&C Red #3 under acidic conditions comprising:

dispersing the Red #3 in a solvent having a pH above about 4.5 wherein at least a majority of the Red #3 by weight is dissolved in the solvent;

then fixing the Red #3 with a substrate;

solubilizing the fixed Red #3 into an aqueous solution in the presence of an amount of gelatin and for a period of time effective to stabilize the Red #3 when said Red #3 is in an aqueous solution below the pH of about 4.5 and provide a substantially cloud-free and precipitate free aqueous solution; and adjusting the pH of the aqueous solution to below about 4.5.

4,165,391

AGENT FOR PROVIDING MEATY FLAVOR IN FOODS

Constance R. Corbett nee Rolison, White Plains, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 694,116, Jun. 8, 1976, abandoned. This application Apr. 29, 1977, Ser. No. 791,342
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—580 18 Claims

1. A food flavoring agent consisting essentially of from about 50% to about 85% by weight hydrolyzed vegetable protein, from about 10% to about 25% by weight yeast autolysate and from about 5% to about 25% by weight on a dry solids basis of soluble modified whey solids selected from the group consisting of delactosed whey solids, the second fraction obtained by passing a liquid mixture of cheese whey solids through a bed of molecular sieve resin, and the permeate and the delactosed permeate resulting from the ultrafiltration of whey, said second fraction having the following composition:

Lactose, %	40–50
Minerals, %	20–35

-continued

Protein, (N × 6.38),	15–20
Lactic Acid, %	7–10
Citric Acid, %	3–6
Fat, %	less than 1
Moisture, %	less than 5
pH	6.6–7.2,

and said permeate having the following composition:

Lactose, %	80–83
Minerals, %	10–12
Protein, (N × 6.38),	4–6,

said delactosed permeate having the following composition:

Lactose, %	42–45
Minerals, %	30–35
Protein, (N × 6.38),	9–11.

4,165,392

PROCESS FOR PRODUCING FIBROUS HIGH-PROTEIN FOOD

Syuji Kawai; Shuzo Ohyabu, both of Kurashiki; Takeo Akiya, Takatsuki; Shunichiro Horio, Hirakata; Naoki Yagi, Suita; Kwang Y. Kim, Habikino, and Tarushige Nakaji, Yao, all of Japan, assignors to Kuraray Co., Ltd. and Minaminihon Rakuno Kyodo Kabushiki Kaisha, both of, Japan

Filed Jan. 17, 1977, Ser. No. 760,293

Claims priority, application Japan, Nov. 12, 1976, 51-136713

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—657 **9 Claims**

1. A process for producing a fibrous high protein product, which comprises the steps of (1) converting a solution comprising a milk prótein into a fibrous product, (2) after or during the conversion step, prestabilizing the resulting fibrous product in an acidic bath of pH 0 to 5 containing 0.5 to 25% of an acidic compound selected from the group consisting of acetic acid, sulfuric acid, and phytic acid, or admixtures thereof for at least 10 seconds; and then (3) actually stabilizing the resultant fibrous product in a saline bath of pH 2.5 to 6.5 containing at least one salt, selected from the group consisting of a potassium salt, a sodium salt, and a calcium salt in an amount of 0.3 to 6 gram equivalents/L as the total cation concentration of the bath, at 90° to 130° C. for from 1 to 3 hours when acetic or sulfuric acid is used in step (2) and 0.5 to 3 hours when phytic acid is used in step (2).

4,165,393

MAGNETIC BRUSH DEVELOPING PROCESS FOR ELECTROSTATIC IMAGES

Kohji Suzuki; Manabu Mochizuki, both of Kawasaki; Hajime Oyama, Tokyo, and Teruyuki Ohnuma, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1976, Ser. No. 742,707

Claims priority, application Japan, Nov. 26, 1975, 50-141409

Int. Cl.[2] G03G *13/09*

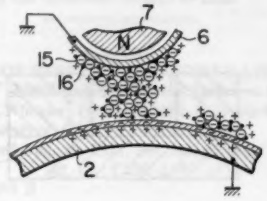
U.S. Cl. 427—18 **6 Claims**

1. In a magnetic toner brush developing process for electrostatic images of the type in which a developer containing a magnetic powder is attracted onto a sheeve of a non-magnetic material by means of a magnet disposed within the sleeve to thereby form a magnetic brush, which brush is brought into contact with an electrostatic latent image formed on a record member to provide a developing thereof, the improvement comprising the steps of:

providing as a developer a powder mixture of a low resistance toner having a volume resistance of not more than 10^5 Ω cm and a high resistance toner having a volume resistance of not less than 10^{13} Ω cm, at least one of which comprises a magnetic toner for forming the magnetic brush;

triboelectrically charging both toners;

selecting the toner materials in accordance with their orders in the triboelectricity series, the high resistance toner being of a higher order and inducing an electrostatic



charge on the low resistance toner, so that the force of electrostatic attraction acting between the toners and the force of electrostatic attraction acting between both toners and the latent image are greater than the force of magnetic attraction exerted by the magnet on the magnetic toner; and

causing a deposition of both toners onto the latent image to provide a developing thereof.

4,165,394

METHOD OF PREPARATION OF A SUBSTRATE MADE OF PLASTIC MATERIAL FOR ITS SUBSEQUENT METALLIZATION

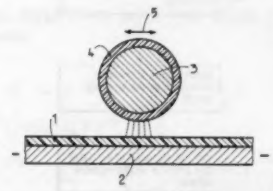
Jean-Paul Ehrbar, La Chaux-de-Fonds, and Claude Ganguillet, Neuchatel, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Feb. 6, 1978, Ser. No. 875,563

Claims priority, application Switzerland, Feb. 16, 1977, 1887/77

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—40 **4 Claims**



1. Method of preparation of a substrate made of plastic material for its subsequent metallization, characterized by the fact that one attacks the surface of the substrate to be metallized by brush discharge, the said brush discharge being realized by Corona discharges applied by successive passages with a density of current which is higher than 0.5 mA/cm^2, the tension being lower than the break-down tension of the substrate, so as to prevent the deterioration of the latter, the density of total charge of energy thus applied being higher than 20 mC/cm^2 so as to render the said surface able to be metallized by chemical way.

4,165,395

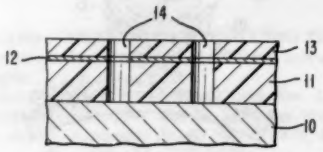
PROCESS FOR FORMING A HIGH ASPECT RATIO STRUCTURE BY SUCCESSIVE EXPOSURES WITH ELECTRON BEAM AND ACTINIC RADIATION

Tai Hon P. Chang, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,757

Int. Cl.[2] B05D *3/06*; B32B *3/10*

U.S. Cl. 427—43 **16 Claims**



1. A method of forming a predetermined high aspect ratio thin film pattern of openings in a resist structure including

coating a substrate with a first layer of resist,

applying a coating of a second layer of resist,

said first layer being relatively thick compared to the minimum dimensions of said pattern openings as measured parallel to the surface of said layer,

employing radiation with electrons from an electron beam operating to write said predetermined pattern in said second layer of resist with said minimum dimensions in said second layer,

forming a corresponding metallic film pattern on said first layer,

employing said thin metallic film pattern as a mask for exposing said first resist to actinic radiation to expose said predetermined pattern therein,

developing said first resist,

whereby a high aspect ratio structure with said predetermined pattern is achieved.

4,165,396

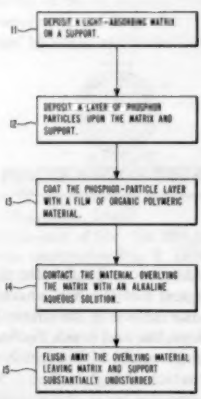
METHOD FOR SALVAGING THE LIGHT-ABSORBING MATRIX AND SUPPORT OF A LUMINESCENT SCREEN

James A. Calamari, Jr., Marion, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,104

Int. Cl.[2] B05D *3/10, 3/00*; B08B *3/08*

U.S. Cl. 427—64 **7 Claims**


11
DEPOSIT A LIGHT-ABSORBING MATRIX ON A SUPPORT.
12
DEPOSIT A LAYER OF PHOSPHOR PARTICLES UPON THE MATRIX AND SUPPORT.
13
COAT THE PHOSPHOR-PARTICLE LAYER WITH A FILM OF ORGANIC POLYMERIC MATERIAL.
14
CONTACT THE MATERIAL OVERLYING THE MATRIX WITH AN ALKALINE AQUEOUS SOLUTION.
15
FLUSH AWAY THE OVERLYING MATERIAL LEAVING MATRIX AND SUPPORT SUBSTANTIALLY UNDISTURBED.

1. In a method for preparing a luminescent viewing screen including depositing a light-absorbing matrix upon a support, depositing a layer of phosphor particles upon said matrix and support and coating said phosphor-particle layer with a film of organic polymeric material, the steps for substantially entirely removing said phosphor-particle layer and film while leaving said matrix substantially undisturbed, said steps comprising:

(a) contacting said film with an alkaline aqueous solution until said film material is at least partially solubilized, said solution having a pH in the range of 8.0 to 13.0,

(b) and then flushing said support with an aqueous medium until said film and phosphor-particle layer are substantially removed.

4,165,397

REPAIR OF GLASS LAMINATES

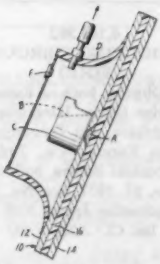
P. H. Ogden, and H. Pennicott, both of Harlow, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 15, 1975, Ser. No. 613,522

Claims priority, application United Kingdom, Sep. 27, 1974, 42117/74; Apr. 18, 1975, 16166/75

Int. Cl.[2] B32B *35/00*

U.S. Cl. 427—140 **8 Claims**



1. A method of repairing crack damage to a glass laminate which comprises subjecting the region of the laminate surface containing the crack to a reduced pressure of no greater than 0.5 mm Hg for at least 10 minutes to remove air from the crack, applying a low viscosity, liquid, curable resin composition to the laminate surface over the crack, removing the reduced pressure and curing the curable resin composition to a transparent polymer whose refractive index is sufficiently close to that of the glass to give a visibly non-obvious repair.

4,165,398

PRESSURE-SENSITIVE COPYING PAPER

Paul R. Raine, Cardiff, and Lawrence Westcott, Bridgend, both of Wales, assignors to Wiggins Teape Limited, Hampshire, England

Filed Jan. 12, 1977, Ser. No. 758,857

Claims priority, application United Kingdom, Jan. 19, 1976, 2031/76

Int. Cl.[2] B41M *5/16*

U.S. Cl. 427—150 **27 Claims**

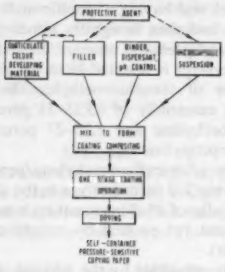
1. A method of preparing pressure-sensitive copying material comprising the steps of:

(a) forming a coating composition comprised of

(i) microcapsules containing a solution of a colourless colour former,

(ii) particulate mineral colour developing material which has been chemically treated with a protective agent in an amount which is less than about 10% based on the weight of the particulate mineral colour developing material and which is effective in inhibiting premature colour development, said protective agent being characterized by being compatible with said microcapsules and by being substantially non-interferring with the

colour developing properties of the colour developing material, and,



(iii) binder; and

(b) applying said coating composition to a substrate.

4,165,399

BINDERLESS INK FOR JET PRINTING

Raymond L. Germonprez, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 634,507, Nov. 24, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 950,079

Int. Cl.[2] C09D *11/00*

U.S. Cl. 427—264 **12 Claims**

9. In a method for depositing indicia on a plastic resin coated metal substrate by a jet ink technique, the improvement which comprises providing a binder-free ink composition capable of bonding to the plastic coating by penetration of the ink into the sub-surface structure of said resin, contacting said plastic surface with said jet ink composition whereby penetration into the sub-surface structure of said plastic is effected and said ink remains embedded in the plastic resin coating upon evaporation of the ink solvents,

said binder-free ink composition consisting essentially of

(a) between about 25 and 75 weight percent of an organic solvent selected from the group consisting of aliphatic ketones ranging in molecular structure from 2-butanone to 2-octanone, aliphatic esters and mixtures thereof;

(b) between about 8 and about 25 percent by weight of an aliphatic monohydric alcohol of no more than three carbon atoms, the upper limit of said percent alcohol present in the composition being so selected as to prevent phase separation of the surfactant component;

(c) between about 8 and 17 percent by weight of an anionic surfactant,

(d) between about 12 and 35 percent by weight of water,

(e) between 0.5 and 5.0 percent by weight of a dye selected from the group consisting of basic dyes and neutral dyes, and

(f) between zero and 10 percent by weight of an aliphatic hydrocarbon having 8 to 12 carbon atoms,

said ink composition having a viscosity at 68° F. of less than 10 cps., a specific resistivity of less than 1500 ohm.-cm. and a surface tension at 68° F. of between 22 and 35 dyne cm.

4,165,400

SELF-EMULSIFYING ANAEROBIC COMPOSITION

JoAnn DeMarco, Southington, Conn., assignor to Loctite Corporation, Newington, Conn.

Division of Ser. No. 697,165, Jun. 17, 1976, Pat. No. 4,069,378. This application Sep. 19, 1977, Ser. No. 834,593

Int. Cl.[2] B05D *3/00, 3/02*

U.S. Cl. 427—295 **5 Claims**

1. A process for impregnating and sealing a porous article comprising the steps of:

(a) impregnating the article with a self-emulsifiable anaerobic-curing composition which comprises:

A. an anaerobically-curing acrylate monomer;

B. a peroxy initiator in sufficient concentration to initiate cure of the monomer upon exclusion of oxygen; and

C. about 0.25 to about 10.0% by weight of the total composition of an anionic or nonionic surfactant which is dissolved in the composition and which renders the composition self-emulsifying upon mixing with water;

(b) washing the surface of the article with water; and

(c) permitting the anaerobic sealant to cure.

4,165,401

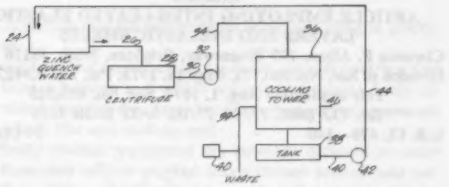
RECOVERY OF SUSPENDED PARTICULATE METAL FROM QUENCH WATER

Zane L. Burke, Whittier, Calif., assignor to Davis Walker Corporation, Commerce, Calif.

Filed Aug. 29, 1977, Ser. No. 828,618

Int. Cl.[2] C23C *1/00*

U.S. Cl. 427—398 B **19 Claims**



1. In the method of treating articles in which the articles are passed through a bath of molten metal and then through a water quench bath for cooling and in which the water quench bath becomes contaminated with suspended, particulate metal carried over from the molten metal bath, the improvement which comprises removing suspended metal contaminant from quench water by centrifuging contaminated quench water.

4,165,402

CHIP-REMOVING MACHINING METHOD AND APPARATUS FOR SEMICONDUCTING CRYSTALS, SPECIFICALLY SUITED FOR THE PRODUCTION OF FORCE AND PRESSURE MEASURING CELLS

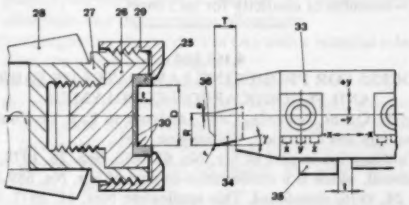
Walter Dubs, Winterthur, and Georg Preiss, Wiesendangen, both of Switzerland, assignors to Kistler Instrumente AG, Switzerland

Filed May 17, 1976, Ser. No. 687,106

Claims priority, application Switzerland, May 16, 1975, 006481/75

Int. Cl.[2] B01J *17/00;* B23B *1/00;* H01L *21/461*

U.S. Cl. 428—64 **22 Claims**



1. A method comprising the step of chip removing machining at least one surface portion of a semiconducting crystal member so as to provide a desired shape for the crystal member by utilizing a chip removing tool having a ground single crystal cutting element with a Mohs hardness greater than 9, providing the single crystal ground cutting element with a clearance angle γ of approximately 5°, a negative cutting angle α of approximately 8° and an angle of incidence β of approxi-

mately 5°, the step of chip removing machining including shaping by rotating and contacting one of the semiconducting crystal member and the cutting element with respect to the other while feeding one of the semiconducting crystal member and the cutting element toward the other in only a single direction, penetrating the surface portion of the semiconducting crystal member, and forming at least one depression therein by chip removing machining.

18. A shaped semiconducting crystal member shaped by the method of claim 1.

21. A machining tool for chip removal machining of at least one surface portion of a semiconducting crystal member, said machining tool being constructed as a shaping tool having a ground cutting member, said ground cutting member being a single crystal provided with a hardness greater than 9 Mohs and having a clearance angle γ of approximately 5°, a negative cutting angle α of approximately 8° and an angle of incidence β of approximately 5°.

4,165,403

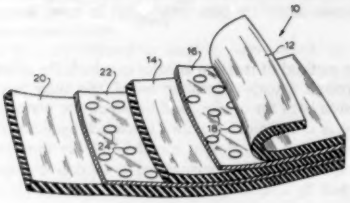
ARTICLE EMPLOYING INTER-LEAVED ELASTIC LAYERS AND INELASTIC SHEETS

Clarence F. Alban, 197 Breezeway, Brighton, Mich. 48116

Division of Ser. No. 360,771, May 16, 1973, Pat. No. 3,842,885. This application Aug. 1, 1974, Ser. No. 493,533

Int. Cl.[2] **B60C** *11/00, 27/00, 5/00;* **B32B** *3/10*

U.S. Cl. 428—140 **16 Claims**



1. An article of manufacture comprising:

opposing elastic layers;

a sheet interposed between said layers, said sheet having a plurality of perforations therein and comprising a material having a relatively high modulus of elasticity with respect to said layers; and wherein

the ratio of the thickness of said layers to the thickness of said sheet is given by

$$t_1/t_2 = \sqrt{E_2/E_1}$$

where:

t_1 = the composite thickness of said layers,

t_2 = the thickness of said sheet,

E_1 = modulus of elasticity for said layers,

E_2 = modulus of elasticity for said sheet.

4,165,404

PROCESS FOR PRODUCING LAMINATES OF FABRIC AND FLUOROCARBON COPOLYMER

Henry E. Quehl, Norwalk, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 617,053, Sep. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 689,386, May 24, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,697

Int. Cl.[2] **B32B** *15/02, 27/06*

U.S. Cl. 428—212 **4 Claims**

1. An improvement in a process for preparing a laminate comprising a fluorocarbon copolymer top sheet and a knitted glass fabric, the improvement comprising placing an interlayer between the knitted glass fabric and the top sheet, said interlayer consisting essentially of a sheet about 1–5 mils thick of a fluorocarbon copolymer having a specific melt viscosity from 5 to 25 $\times$ 10^4 poises being sufficiently low to enable the copolymer to wet and penetrate the fabric at fabrication temperatures and lower than the specific melt viscosity of the fluorocarbon copolymer of the top sheet, said top sheet being about 5–100 mils thick and having a specific melt viscosity of 30–60 $\times$ 10^4 poises, and then integrally bonding the laminate by means of heat and pressure; wherein the fluorocarbon copolymer of the interlayer is selected from the group consisting of

a copolymer of tetrafluoroethylene/hexafluoropropylene consisting essentially of 93.25–73 percent by weight of tetrafluoroethylene and 6.75–27 percent by weight of hexafluoropropylene or

a copolymer of tetrafluoroethylene/perfluoro(alkyl vinyl ether) having 2–3 carbon atoms in the alkyl group consisting essentially of 99–93 percent by weight of tetrafluoroethylene and 1–7 percent by weight of perfluoro (alkyl vinyl ether).

4. A laminate produced by the process of claim 1.

4,165,405

FIBER LUBRICANTS BASED UPON FATTY ESTERS OF HETERIC POLYOXYALKYLATED ALCOHOLS

Robert B. Login, and David D. Newkirk, both of Woodhaven, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 797,007, May 16, 1977, abandoned. This application Jun. 23, 1977, Ser. No. 809,159

Int. Cl.[2] **B05D** *1/28;* **C08K** *5/10;* **D06M** *3/38, 5/08*

U.S. Cl. 428—395 **9 Claims**

1. A lubricated thermoplastic, synthetic fiber comprising a polyester or nylon fiber having incorporated thereon a lubricating composition comprising a heteric polyoxyalkylene monoester capable of volatilizing at 200° C. having the formula:

$$R-\overset{O}{\overset{\|}{C}}-(A)_n-R'$$

wherein R is an aliphatic radical having about 7 to about 22 carbon atoms; A is a mixture of oxyethylene and oxypropylene residues derived from the reaction of ethylene oxide and 1,2-propylene oxide in the respective ratio by weight of 3:7 to 4:1; n has a value to produce a molecular weight of from about 300 to about 3000 and R' is the residue of a monofunctional aryl alcohol or a monofunctional alkyl or arylalkyl alcohol having 1 to about 21 carbon atoms in the alkyl chain.

4. The process of lubricating thermoplastic, synthetic fibers comprising the application to said fibers of a heteric polyoxyalkylene monoester lubricant capable of volatilizing at 200° C. having the formula:

$$R-\overset{O}{\overset{\|}{C}}-(A)_n-R'$$

wherein R is an aliphatic radical having from 7 to 22 carbon atoms; A is a mixture of oxyethylene and oxypropylene residues derived from the reaction of ethylene oxide and 1,2-propylene oxide in the respective ratio by weight of 3:7 to 4:1; n has a value to produce a molecular weight of about 300 to about 3000 and R' is the residue of a monofunctional aryl alcohol or a mono-functional alkyl or arylalkyl alcohol having 1 to about 21 carbon atoms in the alkyl chain.

7. A synthetic fiber lubricating composition comprising a heteric polyoxyalkylene monoester condensation product capable of volatilizing at 200° C. having the formula:

$$R-\overset{O}{\overset{\|}{C}}-(A)_n-R'$$

wherein R is an aliphatic radical having about 7 to about 22 carbon atoms; A is a mixture of oxyethylene and oxypropylene residues derived from the reaction of ethylene oxide and 1,2-propylene oxide in the respective ratio by weight of 3:7 to 4:1; n has a value to produce a molecular weight of about 300 to about 3000 and R' is the residue of a monofunctional compound containing an OH group and having 1 to about 21 carbon atoms in the alkyl chain.

4,165,406

POWDERY COATING COMPOSITION AND PROCESS FOR PREPARING THE SAME

Hideyoshi Tugukuni, Sakai, and Masafumi Kano, Nagaokakyo, both of Japan, assignors to Dai Nippon Toyo Co. Ltd., Oske, Japan

Division of Ser. No. 683,508, May 5, 1976, Pat. No. 4,113,917, which is a division of Ser. No. 400,621, Sep. 25, 1973, Pat. No. 3,970,725. This application Jun. 23, 1978, Ser. No. 918,553

Claims priority, application Japan, Sep. 26, 1972, 47-96541; Oct. 28, 1972, 47-108306

Int. Cl.[2] B32B *23/08, 9/00*

U.S. Cl. 428—407 **5 Claims**

1. A powdery coating composition comprising polymer particles having an average particle size within the range of 0.5 to 200μ and composed of, as a core component, a polymer having a softening point not exceeding 90° C. and selected from the group consisting of epoxy resins and polyester resins, and, as an outer component, a polymer having a softening point of at least 100° C. and being selected from the group consisting of cellulosic plastics, wherein the weight ratio of the core component to the outer component is within the range from 50/50 to 100/1 and said outer component covers said core component.

4,165,407

ADAMITE ROLL MATERIAL FOR A ROLLING MILL

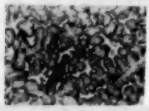
Toru Endoh, Nishinomiya, and Masayuki Katoh, Amagasaki, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jun. 27, 1977, Ser. No. 810,472

Claims priority, application Japan, Jun. 25, 1976, 51/75906; Aug. 21, 1976, 51/99834

Int. Cl.[2] B32B *9/00*

U.S. Cl. 428—408 **6 Claims**



1. Roll-mill roll material consisting of carbon in the range of from 1.4% to 3.0% by weight, silicon in the range of from 0.4% to 1.5% by weight, manganese in the range of from 0.4% to 2.0% by weight, nickel to an amount of 4.0% by weight or less, chromium to an amount of 0.8% by weight or less, molybdenum to an amount of 2.0% by weight or less, and one or more carbide forming elements selected from vanadium, niobium, titanium, zirconium, and tungsten to a total amount in the range of from 0.3% to 3.5% by weight, the remainder of said material being substantially iron, with the proviso that (1) the total amount of carbide forming elements is proportional to the combined total amount of carbon and chromium, and (2) the total amount of carbide forming elements increases with increasing combined total amounts of carbon and chromium.

4,165,408

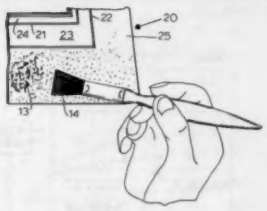
CARDBOARD PICTURE MAT WITH COLORED SURFACE AREAS

Donald C. Pierce, 59 Reposa Vista, Novato, Calif. 94947

Continuation of Ser. No. 760,356, Jan. 19, 1977, abandoned, which is a division of Ser. No. 588,965, Jun. 20, 1975, Pat. No. 4,025,666. This application Feb. 24, 1978, Ser. No. 881,028

Int. Cl.[2] B32B *9/06*

U.S. Cl. 428—452 **6 Claims**



1. A picture mat for mounting pictures, including in combination:

a mat board of cardboard or paper having a dry surface free from adhesives and which accepts and retains finely divided powder, free from liquid medium, up to an amount which fills said surface, and

a finely divided pigmented dry powder, different in color from said surface worked into a chosen area of said surface, filling and retained by said surface, said powder being free from liquid medium, residue of liquid medium, and adhesives,

each particle of said dry powder filling said surface being in contact therewith and being non-smudgeable.

4,165,409

METHOD OF FABRICATING WOOD COMPOSITE PANELS HAVING ENHANCED FIRE RETARDANCY

Jack Maine, Jefferson Apts., Saginaw, Mich. 48605

Filed Feb. 23, 1978, Ser. No. 880,378

Int. Cl.[2] B32B *31/12*

U.S. Cl. 428—535 **3 Claims**

1. A method of enhancing the fire retardancy of fabricated wood panel systems which method consists of

(A) impregnating a first or outer wood member with an aqueous based fire retardant consisting of a mixture of polyethyleneimine and a mixture of monoammonium phosphate and diammonium phosphate;

(B) impregnating the product of (A) with a material selected from the group consisting of

(i) curable tertiary butylstyrene and

(ii) mixtures of curable tertiary butylstyrene, a haloalkyl phosphate flame retardant different than the flame retardant in (A), a crosslinking agent for the tertiary butyl styrene and a catalyst for curing; and then curing said tertiary butylstyrene;

(C) impregnating a second or core wood member with a fire retardant as in (A) and drying;

(D) forming a composite structure from the product of (A) and (B) and the product of (C) by gluing the wood members together and,

(E) attaching a third or balance wood member to the remaining core face opposite the first wood member, whereby a fire retardant composite fabricated wood panel is obtained.

4,165,410

MAGNETIC BUBBLE DEVICES WITH CONTROLLED TEMPERATURE CHARACTERISTICS

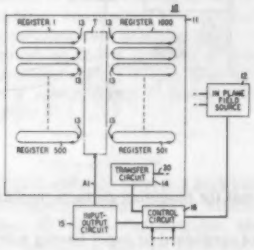
Stuart L. Blank, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 3, 1977, Ser. No. 803,069

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.[2] H01F *1/37*; G11B *5/68*; G11C *11/02*

U.S. Cl. 428—539 **3 Claims**



1. A magnetic bubble device comprising (a) a substrate supporting at least a first layer of an iron containing garnet possessing an uniaxial magnetic anisotropy perpendicular to the layer, which layer is capable of supporting magnetic bubbles which are stable and of a characteristic diameter in a temperature varying bias field over a temperature range, which anisotropy is predominantly a growth induced anisotropy produced by dodecahedral site substitution, which bias field is produced by a magnet adapted for maintaining the layer in the bias field throughout the temperature range, which bias field is less than a bubble collapse field at each temperature within the temperature range and which bias field varies throughout the temperature range at an average variation rate (b) generating means for generating the bubbles; and (c) propagating means for moving the bubbles in order to produce information processing CHARACTERIZED IN THAT the iron garnet is of a composition represented by the atomic formula: $R_{3-d}(Ca,Sr)_dGe_dFe_{5-d}O_{12}$, where R is at least one member of the group consisting of yttrium and the rare earth elements, numbers 57 through 71 of the periodic table of the elements, which said iron garnet is epitaxially deposited from a solution of constituent oxides in a flux, which said flux consists essentially of PbO and B_2O_3 in a weight ratio selected from the range extending from ten to infinity; wherein the weight ratio is selected to produce the first layer of a garnet whose bubble collapse field varies with temperature throughout the temperature range, at approximately the said variation rate.

4,165,411

FLAME RETARDANT URETHANE AND METHOD

Nelson S. Marans; Clifton L. Kehr, both of Silver Spring, and Robert M. Murch, Ashton, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 588,092, Jun. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 404,824, Oct. 9, 1973, abandoned. This application Sep. 20, 1977, Ser. No. 834,927

Int. Cl.[2] C08K *5/52, 5/53, 5/51*

U.S. Cl. 521—107 **27 Claims**

1. A flame retardant hydrophilic polyurethane foam comprising the reaction product of (a) a hydrophilic, NCO terminated, polyoxyalkylene urethane prepolymer wherein at least 40 mole percent of the oxyalkylene units in the prepolymer are oxyethylene units; and (b) water; wherein sufficient amounts of (b) are added to provide an H_2O Index Value of from about 1,300 to about 78,000 and said reaction product containing from about 45 to about 70 weight percent alumina hydrate and from about 2 to about 20 weight percent of a phosphorous containing fire retardant material, said weight percent being based on the total dry weight of the foam.

4,165,412

DELAYED ACTION CATALYSTS FOR POLYURETHANES

Ibrahim S. Bechara, Boothwyn, and Dewey G. Holland, Chadds Ford, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 758,722, Jan. 12, 1977, abandoned, which is a division of Ser. No. 497,138, Aug. 15, 1974, abandoned, which is a division of Ser. No. 292,344, Sep. 26, 1972, Pat. No. 3,862,150. This application Aug. 28, 1978, Ser. No. 937,249

Int. Cl.[2] C08G *18/18, 18/20, 18/14*

U.S. Cl. 521—121 **2 Claims**

1. A method for producing a polyurethane product which comprises polymerizing an organic polyisocyanate containing a plurality of isocyanato groups per molecule and an organic polyol containing a plurality of hydroxyl groups per molecule at a temperature in the range of about 70° C. to 200° C. in the presence of a delayed action catalyst comprising a tertiary amine salt of a carboxylic acid substituted in the alpha position selected from the group consisting of cyanoacetic acid, nitroacetic acid, acetone dicarboxylic acid, sulfonyl diacetic acid, thionyldiacetic acid, acetoacetic acid, and benzoylacetic acid, and said salt irreversibly decomposing to catalytically active tertiary amine selected from the group consisting of tetramethyl butane diamine, trimethyl aminoethyl piperazine, tetramethyl guanidine, azabicyclo heptanes, azabicyclooctanes, N-allyl piperidine, 2,2'oxybis-(morpholino ethyl ether), amidines, N-alkyl imidazoles, and silyl morpholines with decomposition of the acid component at a temperature in the range of about 70° C. to 200° C.

4,165,413

PROCESS FOR PRODUCING PHENOLIC FOAMS WITH A UNIFORM APPEARANCE

Robert H. Sefton, McMurray, and John D. Carlson, Bradford Woods, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 886,895, Mar. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 825,772, Aug. 18, 1977. This application Sep. 20, 1978, Ser. No. 944,038

Int. Cl.[2] C08J *9/14*

U.S. Cl. 521—128 **4 Claims**

1. A process for preparing phenolic foam comprising:
(a) preparing a foamable mixture comprising a foamable phenol-aldehyde resin, a blowing agent, and N-methyl-2-pyrrolidone;
(b) foaming the mixture by adding an acid catalyst; and
(c) curing the phenolic foam.

4,165,414

URETHANE-MODIFIED ISOCYANURATE FOAMS HAVING IMPROVED INSULATING AND FLAME RETARDANT PROPERTIES

Thirumurti Narayan, Riverview; John T. Patton, Jr., Wyandotte; Moses Cenker, Trenton, all of Mich., and Harald P. Wulff, Baton Rouge, La., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 23, 1978, Ser. No. 871,439

Int. Cl.[2] C08G *18/14, 18/20, 18/24, 18/16*

U.S. Cl. 521—129 5 Claims

1. A urethane-modified isocyanurate foam prepared by catalytically condensing in the presence of a blowing agent and employing an NCO/OH ratio of from 3:1 to 100:1, (a) a polyol with an organic polyisocyanate in the presence of from 15 to 80 parts per 100 parts of organic polyisocyanate of 2,2,2-trichloroethanol or (b) a polyol with a modified polyisocyanate having a free isocyanate content of from 5 to 30 weight percent obtained by the reaction of an organic polyisocyanate with from 15 to 80 parts per 100 parts of organic polyisocyanate of said 2,2,2-trichloroethanol.

4,165,415

METHOD FOR PREPARATION OF A FOAM OF CHLORINATED VINYL CHLORIDE POLYMER EMPLOYING A LOWER ALIPHATIC ALCOHOL FOAMING AGENT

Terufumi Adachi, and Michifumi Tanga, both of Shinnan'yo, Japan, assignors to Tokuyama Sekishi Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1976, Ser. No. 736,595

Claims priority, application Japan, Nov. 5, 1975, 50-133401

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—145 8 Claims

1. A method for preparing a foam of a chlorinated polymer of vinyl chloride which comprises mixing a chlorinated polyer of vinyl chloride with from 1 to 5 parts by weight per 100 parts by weight of the chlorinated polymer of a foaming agent consisting essentially of a lower aliphatic monohydric alcohol having 1 to 5 carbon atoms, said chlorinated polymer having an average degree of polymerization of from 100 to 2000 and a chlorine content of from 60 to 70% by weight; and heating the mixture of chlorinated polymer and alcohol to a temperature and for a time sufficient to cause it to foam.

4,165,416

CURED OR UNCURED CHLORINATED POLYETHYLENE COMPOSITION AND PROCESS FOR CURING UNCURED CHLORINATED POLYETHYLENE

Yasuo Matoba, Suita; Akira Hashimoto, Itami, and Mikio Sugahara, Kawanishi, all of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan

Filed Mar. 25, 1977, Ser. No. 781,300

Claims priority, application Japan, Aug. 2, 1976, 51/92638; Aug. 24, 1976, 51/101377; Aug. 24, 1976, 51/101378; Jan. 24, 1977, 52/6962

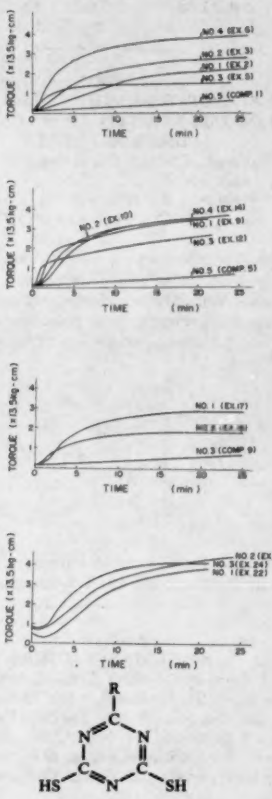
Int. Cl.[2] C08K *5/37*; C08J *3/24*

U.S. Cl. 525—346 5 Claims

1. A curable chlorinated polyethylene composition free from hexamethylphosphoric triamide complex consisting essentially of:

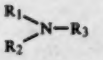
(A) chlorinated polyethylene having a chlorine content of about 20 to 50%, said polyethylene having a molecular weight of about 20,000 to 500,000;

(B) a mercaptotriazine cross-linking agent of the formula



wherein R is a member selected from the group consisting of a mercapto group, alkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms, dialkylamine groups with the alkyl moiety containing 1 to 8 carbon atoms, cycloalkylamino groups with the cycloalkyl moiety containing 6 to 8 carbon atoms, dicycloalkylamino groups with the alkyl moiety containing 6 to 8 carbon atoms, arylamino groups, N-aryl-N-alkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms and alkoxy groups containing 1 to 8 carbon atoms;

(C) a cross-linking accelerator selected from the group consisting of secondary and tertiary amines of the formula



wherein R_1, R_2 and R_3 are each a member selected from the group consisting of hydrogen atoms, C_1–C_{12} alkyl groups, C_3–C_{12} cycloalkyl groups and C_7–C_{12} aralkyl groups, at least two of which R_1–R_3 are members other than hydrogen, which R_1 and R_2, or R_1 and R_2, and R_2 and R_3 may taken together form a C_4–C_6 hydrocarbon ring, which hydrocarbon ring may also contain a hetero atom and form a heterocyclic ring; as well as the carboxylates, mercaptothiazole salts, dithiocarbamates and dithio-

phosphates of said secondary and tertiary amines and the benzothiazylsulfenamides of said secondary amines;

(D) an acid acceptor of metal compounds; and

(E) an additive selected from the group consisting of a plasticizer and a reinforcing agent, the amount of said additive being about 0.1 to about 100 parts by weight per 100 parts by weight of the chlorinated polyethylene.

4,165,417

3-(TERT-ALKYLTHIO)-1,3-THIAZOLIDIN-2,4-DIONE USED TO INHIBIT PREMATURE VULCANIZATION OF DIENE RUBBERS

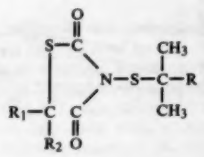
Mark D. Wolfinger, Chicago, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 23, 1977, Ser. No. 854,092

Int. Cl.[2] C08C *1/00, 4/00;* C07D *277/04*

U.S. Cl. 525—3 **6 Claims**

1. A method of inhibiting premature vulcanization of sulfur vulcanizable diene rubber containing sulfur vulcanizing agent and an organic vulcanization accelerating agent which comprises incorporating therein, in an amount effective to inhibit premature vulcanization, a compound of the formula



in which R is alkyl of 1–9 carbon atoms, and R_1 and R_2 independently are hydrogen, alkyl of 1–8 carbon atoms or phenyl.

4,165,418

PAINT MANUFACTURE

Derek N. A. Speakman, Ruislip, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 580,348, May 23, 1975, Pat. No. 4,059,547, which is a division of Ser. No. 242,803, Apr. 10, 1972, abandoned. This application Feb. 8, 1977, Ser. No. 766,594

Claims priority, application United Kingdom, Apr. 15, 1971, 9494/71

Int. Cl.[2] C08F *8/08, 8/30, 8/00*

U.S. Cl. 525—377 **9 Claims**

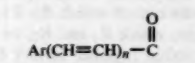
1. A pigment dispersant suitable for use in making a series of paints, the dispersant being a copolymer comprising units derived from the following ethylenically unsaturated monomers in the stated proportions by weight based on the total weight of the copolymer;

(a) 0–50% of a hydroxy group containing monomer, and/or

(b) 0–20% of an amide group containing monomer, provided that there is always present at least 5% of (a) or (b);

20–80% of a monomer free from carboxyl groups and containing a straight or branched chain alkyl group of from 7 to 22 carbon atoms, and

(d) a component containing one or more monomers free from the groups mentioned in (a), (b), or (c), said component including as an essential constituent up to 20% based on the total weight of the copolymer of a comonomer containing an epoxide group, said expoxide group having been reacted with a compound bearing a carboxyl group and a pigment dispersant group and having the formula



OH where AR is an aromatic group and n is 1 or 0, the total amount of said component (d) being up to 50% and the total of monomers being 100%.

4,165,419

METAL SURFACES COATED WITH ALIPHATIC ACIDS CONTAINING 12 CARBON ATOMS OR MORE TO ELIMINATE POLYMER BUILD-UP ON REACTOR WALLS DURING THE POLYMERIZATION OF WATER-SOLUBLE CATIONIC POLYMERS

Naoyuki Suzuki; Yoji Wada; Akihisa Furuno; Iwao Ohshima, and Yukio Shibuya, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd.; Mitsubishi Rayon Co., Ltd. and Diafloc Co., Ltd., all of Tokyo, Japan

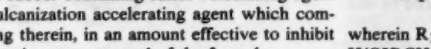
Filed Jun. 5, 1978, Ser. No. 912,804

Claims priority, application Japan, Jun. 3, 1977, 52-65383

Int. Cl.[2] C08F *2/00, 18/00*

U.S. Cl. 526—62 **12 Claims**

1. In a method for producing a water-soluble cationic polymer by polymerizing, in the presence of water, a high concentration of (a) at least one vinyl monomer represented by the following general formula (I)



(I)

wherein R_1 is —H or $—CH_3$; R_2 is $—CH_2CH_2—$ or $—CH_2CH(OH)CH_2—$; R_3 and R_4, which may be the same or different, each is $—CH_3$ or $—CH_2CH_3$; R_5 is $—C_nH_{2n+1}$ where n is 0 or an integer of 1 to 4, $—CH_2C_6H_5$, or $—CH_2COOH$; and X is Cl^-, Br^-, $\frac{1}{2}SO_4^{--}$ or $CH_3SO_4^-$,

or (b) a mixture of (i) at least one vinyl monomer represented by the general formula (I) and (ii) at least one other vinyl monomer copolymerizable therewith, wherein said vinyl monomer represented by the general formula (I) is present in said mixture in a predominant amount, and obtaining a polymer in a lump form, the improvement comprising performing the polymerization in a polymerization zone defined by a metal surface or surfaces, in which the metal surface(s) contacted during the polymerization have been coated with a layer of at least one of a higher aliphatic acid having 12 or more carbon atoms, an ammonium salt of a higher aliphatic acid having 12 or more carbon atoms and/or an alkali metal salt of a higher aliphatic acid having 12 or more carbon atoms.

4,165,420

SOLID STATE POLYMERIZATION OF POLYESTER PREPOLYMER

Verne R. Rinehart, Bath, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 850,119, Nov. 10, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,161

Int. Cl.[2] C08G *63/26*

U.S. Cl. 526—63 **8 Claims**

1. In a solid state process for polymerizing low molecular weight particulate polyester prepolymer to high molecular weight polyester resin the improvement which comprises the use in said process of dry, crystalline polyester prepolymer having an intrinsic viscosity ranging from about 0.1 to about 0.35 and essentially in the form of discrete spherical beads ranging in size from about 100 to about 250 microns in diameter.

4,165,421

HYDROXY TERMINATED POLYBUTADIENE BASED POLYURETHANE BOUND PROPELLANT GRAINS

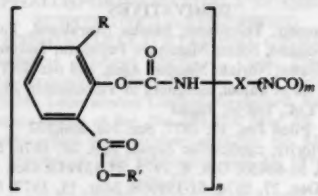
William H. Graham, and Inella G. Shepard, both of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 741,591, Nov. 15, 1976, Pat. No. 4,098,626. This application Sep. 26, 1977, Ser. No. 836,925

Int. Cl.[2] C08G *18/32, 18/62;* G08G *18/69*

U.S. Cl. 528—75 **8 Claims**

1. A curable composition comprising a hydroxy terminated polybutadiene and a compound of the formula:



wherein X is an n+m valent organic radical; R is hydrogen, or lower alkyl of from 1 to about 10 carbon atoms; R′ is lower alkyl of from 1 to about 10 carbon atoms, or carbocyclic aryl of from 6 to about 10 carbon atoms; n is on the average at least 1; m is 1; and n+m must be at least 2.

4,165,422

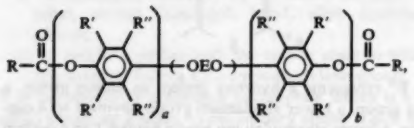
ACYL CAPPED QUINONE-COUPLED POLYPHENYLENE OXIDES

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 26, 1977, Ser. No. 800,644
Int. Cl.[2] C08G *65/44, 65/48*
U.S. Cl. 525—397 **12 Claims**

1. An acyl capped quinone-coupled polyphenylene oxide of the formula:

(I)



wherein independently each +OEO+ is a divalent quinone residue, E is a divalent arene radical, either a or b is at least equal to 1, R′ is hydrogen, a hydrocarbon radical, a halohydrocarbon radical having at least 2 carbon atoms between the halogen atoms and phenol nucleus, a hydrocarbonoxy radical, or a halohydrocarbonoxy radical having at least two carbon atoms between the halogen atoms and phenol nucleus, R″ being the same as R′ and, in addition, halogen, and R is an alkyl, cycloalkyl or aryl radical.

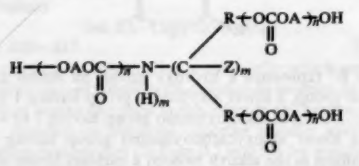
4,165,423

POLY-(CARBONATE-URETHANE)-TRIOLS AND PREPARATION THEREOF

Claude G. Passagne, Champigny sur Marne; Jean-Pierre G. Senet, Melun; Remy R. Lippler, and Jacques Plazanet, both of Bergerac, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Nov. 30, 1977, Ser. No. 855,963
Claims priority, application France, Dec. 23, 1976, 76 38823
Int. Cl.[2] C08G *18/00*
U.S. Cl. 528—370 **5 Claims**

1. A poly-(carbonate-urethane)-triol of the formula:



wherein A is an alkylene or cycloalkylene group, R is an alkylene group having up to 4 carbon atoms, Z is an alkyl group having up to 4 carbon atoms, n is a number representing the degree of polymerisation, and m is an integer selected from 0 and 1, said poly-(carbonate-urethane)-triol having a molecular weight of less than 5000 and being liquid.

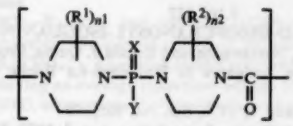
4,165,424

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 15, 1978, Ser. No. 917,031
Claims priority, application United Kingdom, May 21, 1975, 21974/75
Int. Cl.[2] C08G *69/42*
U.S. Cl. 528—370 **13 Claims**

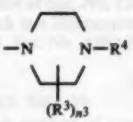
1. A solid polymer consisting essentially of repeating units of the formula



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group, or —OR or —NR_2, or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group; and

(iv) n^1, n^2, and n^3 each represent zero or an integer.

4,165,425

ALKYL TIN OXIDE CURED POLYSULFIDE RUBBERS IN HOT MELT APPLICATIONS

Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed Jun. 8, 1978, Ser. No. 913,626
Int. Cl.[2] C08G *75/04*
U.S. Cl. 528—374 **6 Claims**

1. A process for the preparation of a formed article of manufacture comprising a cured rubber based on a thiol terminated liquid polysulfide polymer cured with a dialkyl tin oxide which comprises:

a. extruding said cured rubber through a die under heat and pressure; and

b. allowing the extruded rubber of step (a) to cool and solidify.

4,165,426

ZINC OXIDE CURED POLYSULFIDE POLYMERS CONTAINING LEVULINIC ACID SUITABLE FOR HOT MELT APPLICATION

Henry N. Paul, III, Philadelphia, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed Jun. 8, 1978, Ser. No. 913,627
Int. Cl.[2] C08G 75/04
U.S. Cl. 528—374 7 Claims

1. A cured rubbery composition based on a thiol terminated liquid polysulfide polymer which comprises the reaction product of a thiol terminated liquid polysulfide polymer, zinc oxide, and levulinic acid said zinc oxide being present at from about 1 part by weight to about 50 parts by weight per one hundred parts by weight of polysulfide polymer and said levulinic acid being present at about 0.5 parts by weight to about 5 parts by weight per one hundred parts by weight of polysulfide polymer.

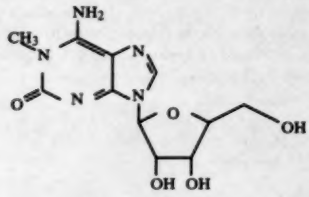
4,165,427

1-METHYL-9β-D-RIBOFURANOSYL-ISOGUANINE

Richard P. Gregson, Narraweena, and Ronald J. Quinn, Cromer, both of Australia, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 1, 1978, Ser. No. 930,100
Claims priority, application Luxembourg, Apr. 3, 1977, 77910
Int. Cl.[2] C07H 17/00
U.S. Cl. 536—24 2 Claims

1. A compound of the formula



and the tautomeric forms thereof.

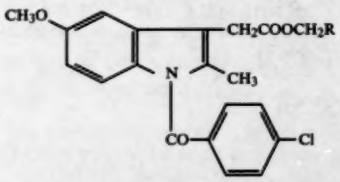
4,165,428

INDOLEACETIC ACID ESTER DERIVATIVES

Kanji Noda, Chikushino; Akira Nakagawa; Satoru Miyata, both of Tosu; Yoichi Nakashima, Tachiarai, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Saga, Japan

Filed Jun. 7, 1977, Ser. No. 804,280
Claims priority, application Japan, Jun. 22, 1976, 51-74104
Int. Cl.[2] C07D 209/28, 213/79
U.S. Cl. 546—273 1 Claim

1. A compound of the following formula:



wherein R is pyridyl or phenyl substituted with one or two substituents at any position, said substituents being selected from the group consisting of fluorine, methyl and trifluoromethyl.

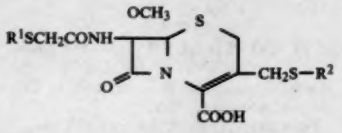
4,165,429

7α-METHOXY-CEPHALOSPORANIC ACID DERIVATIVES

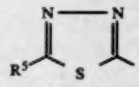
Masaru Iwanami, Yokohama; Masuo Murakami, Tokyo; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo; Tetsuya Maeda, Urawa; Noriaki Nagano, Ages, and Atsuki Yamazaki, Ichikawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1977, Ser. No. 806,932
Claims priority, application Japan, Jun. 28, 1976, 51-76209; Jul. 7, 1976, 51-80659; Oct. 8, 1976, 51-121143; Oct. 15, 1976, 51-123601; Dec. 27, 1976, 51-159908; Mar. 11, 1977, 52-26835
Int. Cl.[2] C07D 501/56; A61K 31/545
U.S. Cl. 544—21 3 Claims

1. The 7α-methoxy-7β-heterocyclic thioacetamido-3-heterocyclic thiomethyl-Δ^3-cephem-4-carboxylic acid represented by the formula

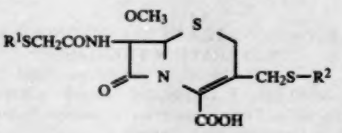


and the pharmaceutically acceptable salts thereof wherein R^1 is

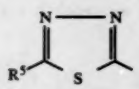


wherein R^5 represents a hydroxy group, an amino group, a mercapto group, a lower alkylamino group having 1 to 4 carbon atoms, a lower alkanoylamino group having 1 to 4 carbon atoms, a lower alkoxycarbonylamino group having 1 to 4 carbon atoms in the alkoxy moiety, a carboxy lower alkylthio group having 1 to 4 carbon atoms in the alkyl moiety, or a 3-lower alkylureido group having 1 to 4 carbon atoms in the alkyl moiety; and R^2 is a 5-lower alkyl-1,3,4-thiadiazol-2-yl group.

2. The 7α-methoxy-7β-heterocyclic thioacetamido-3-heterocyclic thiomethyl-Δ^3-cephem-4-carboxylic acid represented by the formula



and the pharmaceutically acceptable salts thereof wherein R^1 is



wherein R^5 represents a hydroxy group, an amino group, a mercapto group, a lower alkylamino group having 1 to 4 carbon atoms, a lower alkanoylamino group having 1 to 4 carbon atoms, a lower alkoxycarbonylamino group having 1 to 4 carbon atoms in the alkoxy moiety, a carboxy lower alkylthio group having 1 to 4 carbon atoms in the alkyl moiety, or a 3-lower alkylureido group having 1 to 4 carbon atoms in the alkyl moiety; and R^2 is a 1-lower alkyl-tetrazol-5-yl group.

4,165,430

CEPHALOSPORINS HAVING A 7-CARBOXY SUBSTITUTED α-ETHERIFIED OXIMINOARYLACETAMIDO) GROUP

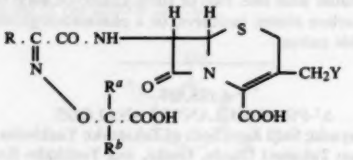
Janice Bradshaw, Harrow; Martin C. Cook, Liverpool, and Gordon I. Gregory, Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation-in-part of Ser. No. 668,529, Mar. 19, 1976, Pat. No. 4,103,084, which is a continuation of Ser. No. 533,451, Dec. 16, 1974, abandoned. This application Jun. 15, 1976, Ser. No. 696,276

Int. Cl.[2] C07D *501/46;* A61K *31/545*

U.S. Cl. 544—22 15 Claims

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula:



wherein

R is thienyl or furyl;

R^a is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

R^b is hydrogen, carboxy, C_2–C_5 alkoxycarbonyl, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

or R^a and R^b together with the carbon atom to which they are attached form a C_{3-7} cycloalkylidene group;

Y is the residue of a nitrogen nucleophile which is a tri(C_{1-6} alkyl) amine, or a heterocyclic tertiary amine which is a pyridine, pyrimidine, pyridazine, pyrazine, pyrazole, imidazole, triazole, thiazole, benzotriazole or purine, which may be substituted by a C_{1-6} alkyl, phenyl, naphthyl, phenyl C_{1-6} alkyl, (C_{1-6} alkoxy) methyl, (C_{2-7} alkanoyloxy)methyl, formyl, C_{2-7} alkanoyl, C_{2-7} alkanoyloxy, carboxy, C_{2-7} alkoxycarbonyl, carboxy (C_{1-6} alkyl), sulpho, C_{1-6} alkoxy, phenoxy, phenyl C_{1-6} alkoxy, C_{1-6} alkylthio, phenylthio, phenyl C_{1-6} alkylthio, cyano, hydroxy, carbamoyl, N-(C_{1-6} alkyl) carbamoyl, N,N-di(C_{1-6} alkyl) carbamoyl, N-(hydroxy C_{1-6} alkyl)carbamoyl or carbamoyl C_{1-6} alkyl group; or azido, and a physiologically acceptable salt, ester or a 1-oxide thereof.

4,165,431

CHLORINATION OF POLYOLEFINS IN THE PRESENCE OF COMPLEX FORMERS

Franz Alfes, Krefeld; Diez Heine, Leverkusen; Reinhard Kaiser, Cologne; Günter Kolb, Leverkusen; Joachim Probst, Cologne, and Franz Weider, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,675

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709689

Int. Cl.[2] C08F *8/20, 8/22*

U.S. Cl. 525—357 7 Claims

1. A process for chlorinating a polyolefin which comprises chlorinating the polyolefin with chlorine in solution or suspension or first in one and then in the other in the presence of (1) an iron, titanium or antimony chlorine transfer agent, (2) a chlorination catalyst and (3) from 0.2 to 0.5% by weight, based on the polyolefin, of at least one compound of the formula H_2N+R—$NH\frac{}{n}H$ wherein R is ethylene, propylene or butylene and n is from 1 to 6, at a temperature of from 40° to 60° C. up to a chlorine content of from 60 to 70% by weight.

4,165,432

PEROXY DI-ESTER POLYOLS

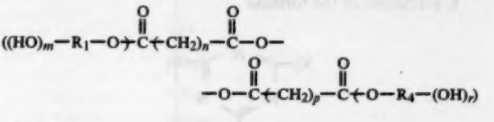
Frank J. Preston, Meriden; Theodore C. Kraus, Cheshire, and Kiran B. Chandalia, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 18, 1977, Ser. No. 843,103

Int. Cl.[2] C07C *69/34, 69/42*

U.S. Cl. 536—4 3 Claims

1. A peroxy bis-ester polyol characterized by the formula:



wherein:

m and r are the same and represent the integer 2;

n and p are the same and represent an integer from 2 to 4; and

((HO)—R_1—O+ and +O—R_4—$(OH)_r$) are the same and represent residues of polyether polyols, $R_1(OH)_{m+1}$ and $R_4(OH)_{r+1}$, wherein R_1 and R_4 represent polyether chains having an average equivalent weight of from about 700 to 3000, after removal of one hydroxy hydrogen therefrom.

4,165,433

METHOD FOR CONVERTING DEXTRO TO LEVO ROTATORY CHITIN

Paul R. Austin, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Division of Ser. No. 728,257, Sep. 30, 1976, Pat. No. 4,059,457, which is a continuation-in-part of Ser. No. 659,280, Feb. 19, 1976, Pat. No. 4,062,921. This application Sep. 20, 1977, Ser. No. 834,938

Int. Cl.[2] C09J *3/04*

U.S. Cl. 536—20 1 Claim

1. A method of converting dextro rotatory chitin to levo rotatory chitin by dissolving chitin in dimethylacetamide or N-methylpyrrolidone or mixtures of these amides, in conjunction with about 2% of lithium chloride.

4,165,434

LASER DYES COMPRISING FLUORESCENT AND LASER DYESTUFF RESIDUES

Fritz P. Schäfer, and Wolfgang Lüttke, both of Göttingen-Nikolausberg, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,337

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1976, 2655177

Int. Cl.[2] C07C *15/00;* C07D *251/30, 251/54, 311/82*

U.S. Cl. 544—197 9 Claims

1. Dyestuff comprising at least one laser dyestuff radical and at least one fluorescent dyestuff radical the fluorescent range of said fluorescent dyestuff radical overlapping the absorption range of the laser dyestuff radical and being linked with the laser dyestuff radical directly or via a bridge member having a length of at most 20 Å in such a manner that the π-electron systems of the individual laser dyestuff radical of fluorescent dyestuff radical are decoupled.

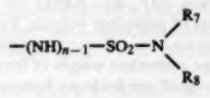
4,165,435
FIRE RETARDANT S-TRIAZINE DERIVATIVES

Armin Hiestand, Binningen, and Peter Rohringer, Schönenbuch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,009
Claims priority, application Switzerland, Jun. 25, 1976, 8156/76
Int. Cl.[2] C07D *251/38, 251/52, 251/66*
U.S. Cl. 544—197 2 Claims

1. s-Triazine of the formula

wherein X_2 is a radical of the formula



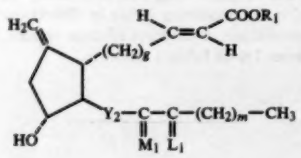
wherein n is 1 or 2, and R_7 and R_8 each are phenyl, benzyl, alkyl with 1 to 4 carbon atoms, or hydrogen, and Z_2 has the meanings given for X_2, or is diethylamino or dimethylamino, and, if n in formula (3.1) is 2, Z_2 also is ethoxy, methoxy, phenoxy or benzyloxy.

4,165,436
TRANS-2,3-DIDEHYDRO-9-DEOXY-9-METHYLENE-PGF COMPOUNDS

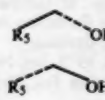
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 5, 1978, Ser. No. 893,771
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 17 Claims

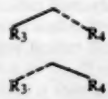
1. A prostaglandin analog of the formula



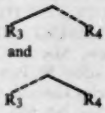
wherein m is one to 5, inclusive; wherein Y_2 is trans-CH=CH-, $-CH_2CH_2-$, or cis-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl; wherein L_1 is



or a mixture of



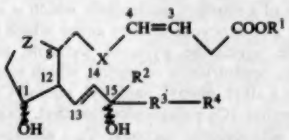
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein g is 4, 5, or 6;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,165,437
Δ^3-PROSTAGLANDIN ANALOGS

Masaki Hayashi; Seiji Kori, both of Takatsuki; Yoshinobu Arai, Toyonaka; Takanori Okada, Osaka, and Yoshitaka Konishi, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Company, Ltd., Osaka, Japan

Division of Ser. No. 774,828, Mar. 7, 1977. This application Aug. 17, 1978, Ser. No. 934,444
Claims priority, application United Kingdom, Mar. 12, 1976, 10118/76; Aug. 9, 1976, 33154/76
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 7 Claims

1. Prostaglandin analogues of the general formula:



wherein X represents ethylene, Z represents

R^1 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, R^2 represents a hydrogen atom or a methyl group, R^3 and R^4 together represent a straight- or branched-chain alkyl group containing from 1 to 10 carbon atoms, and the double bond between C_3–C_4 is trans or cis, or trans and cis, and the double bond between C_{13}–C_{14} is trans and cyclodextrin clathrates of such acids and esters, and when R^1 represents a hydrogen atom, non-toxic salts thereof.

4,165,438
SYNTHESIS OF ACRYLIC ACIDS AND ESTERS

Ronald A. Schneider, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 356,887, May 3, 1973. This application Oct. 20, 1976, Ser. No. 734,065
Int. Cl.[2] C07C *69/54*
U.S. Cl. 560—211 5 Claims

1. A process for producing acrylic acid and esters which comprises passing into a reaction zone the reactants formaldehyde and a lower alkanoic acid or lower alkyl ester thereof and therein reacting said reactants in the vapor phase at a tempera-

ture of about 300° C. to 500° C. in the presence of a catalyst consisting essentially of vanadium orthophosphate having an intrinsic surface area of from about 10 to about 50 m^2/g and a P/V atomic ratio of 1:1 to 1.5:1.

4,165,439

PROCESS FOR THE SELECTIVE ORTHO-ALKYLATION OF A PHENOL IN THE PRESENCE OF A COPPER-CHROMIUM CATALYST

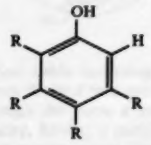
William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 676,503, Apr. 13, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,315

Int. Cl.[2] C07C *37/12, 39/06*

U.S. Cl. 568—804 **8 Claims**

1. A process for the selective ortho-alkylation of a phenolic compound of the general formula:



wherein each R is a monovalent substituent selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms, aryl of 6 to 12 carbon atoms and alkaryl of 7 to 12 carbon atoms, the process comprising reacting at a temperature of at least 185° C. in the presence of copper chromite catalyst said phenolic compound with an alkanol of 1 to about 12 carbon atoms.

4,165,440

CATALYTIC HYDRATION OF ETHYLENE OXIDE TO ETHYLENE GLYCOL

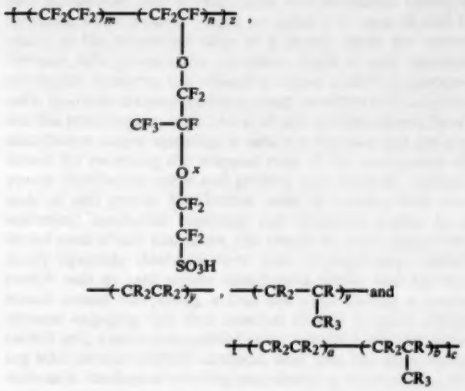
Leo Kim, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 730,049, Oct. 6, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,526

Int. Cl.[2] C07C *29/00*

U.S. Cl. 568—867 **4 Claims**

1. In the process of adding water to ethylene oxide to produce ethylene glycol by contacting ethylene oxide with water in the presence of an acid ion exchange resin at an initial water to ethylene oxide weight ratio varying from about 1:1 to about 100:1 and a temperature between about 50° C. to about 110° C., the improvement which comprises using as the acid ion exchange resin a resin selected from the group consisting of resins having the formulas:



where n, m, x and z are integers such that the equivalent weight is less than 2000 and where R is individually a hydrogen, a fluorine and a —SO_3H group, at least some of the carbons attached to greater than one R have both a fluorine and a —SO_3H group attached thereto and where a, b, and c are integers the sum of which are such that the equivalent weight is less than 2000.

4,165,441

PROCESS FOR THE PREPARATION OF STYRENE

Takeshi Okano; Tetsuo Masuyama, both of Machida, and Toshiharu Yokoyama, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

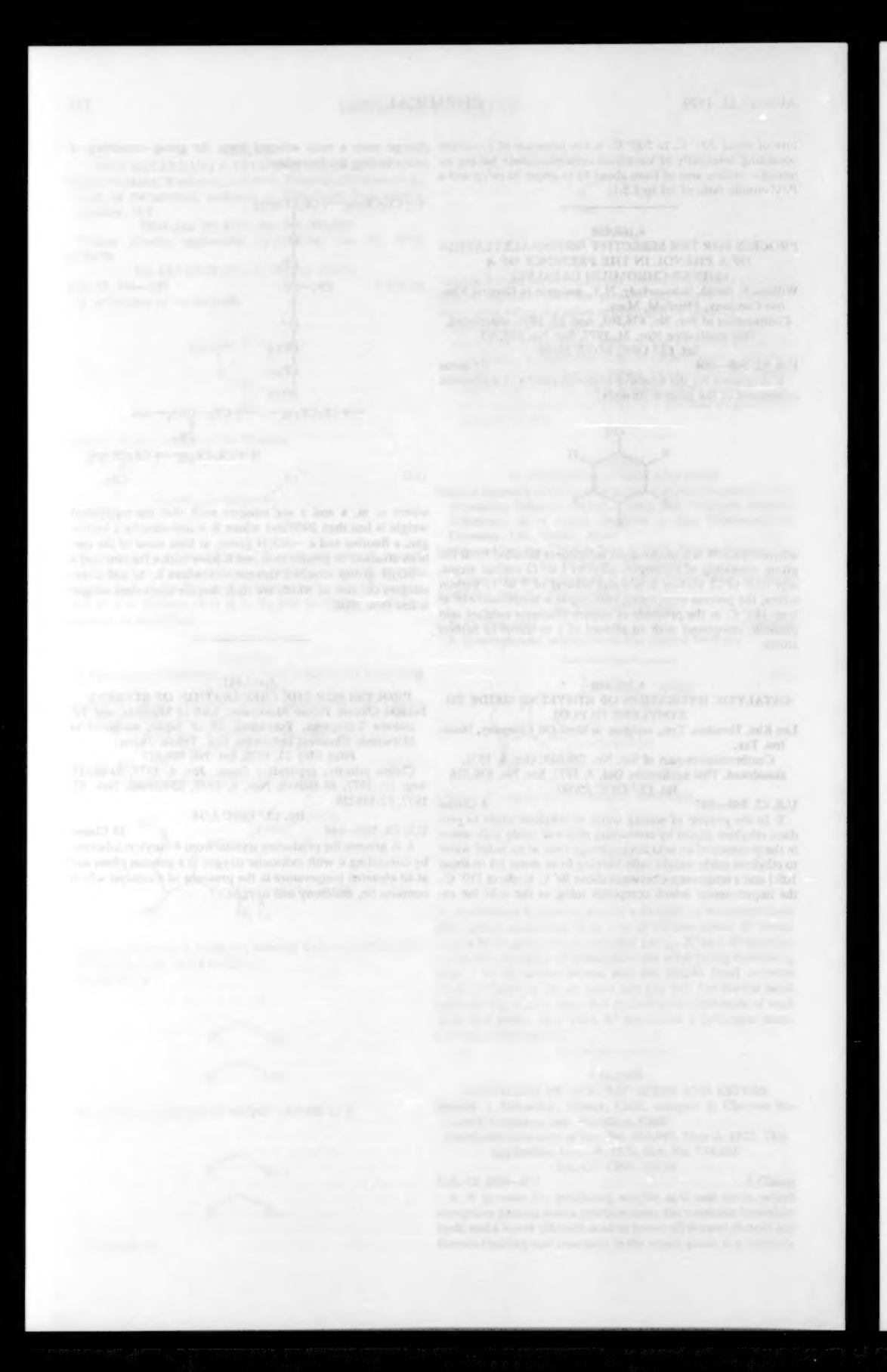
Filed May 23, 1978, Ser. No. 908,817

Claims priority, application Japan, Jun. 6, 1977, 52-66507; Aug. 23, 1977, 52-100888; Nov. 8, 1977, 52-133686; Nov. 17, 1977, 52-138228

Int. Cl.[2] C07C *5/38*

U.S. Cl. 585—444 **15 Claims**

1. A process for producing styrene from 4-vinylcyclohexene by contacting it with molecular oxygen in a gaseous phase and at an elevated temperature in the presence of a catalyst which contains tin, antimony and oxygen.

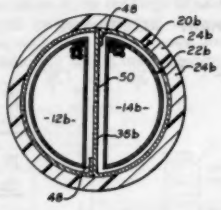


4,165,442

TELEPHONE CABLE WITH IMPROVED SHIELD COMBINATION

Anthony P. Gabriel, Staten Island, N.Y., and Jimmy Justiss, Bonham, Tex., assignors to General Cable Corporation, Greenwich, Conn.

Filed Jun. 12, 1978, Ser. No. 914,505
Int. Cl.[2] H01B 11/06
U.S. Cl. 174—36 12 Claims



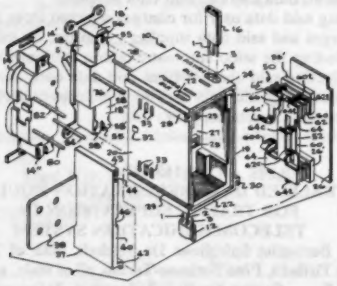
1. A communication cable including a core containing a plurality of conductors divided into groups along a generally diametral plane through the core, a metal screen, that is a conductor of electricity, having a middle panel that extends between said different groups at said diametral plane, the middle panel of the metal screen being bent in opposite circumferential directions at the opposite ends thereof and curving around the circumferential portions of the different groups of conductors and extending circumferentially around one-half of the circumference of the core to form a portion of the screen that is of semi-circular cross-section, and each of the portions of the screen that is of semi-circular cross-section having end portions, remote from its connection to the middle panel of the screen, said end portions being bent inward substantially parallel to the middle panel of the screen, and a layer of dielectric material on one side of the screen.

4,165,443

POWER DISTRIBUTION SYSTEM

Earl C. Figart, 815 Fir Dr.; J. Kevin Kelly, 1036 Greenfield Cir., and Richard A. Di Marcello, 1312 Penfield Rd., all of State College, Pa. 16801

Filed Jul. 24, 1975, Ser. No. 598,644
Int. Cl.[2] H02G 3/18
U.S. Cl. 174—53 45 Claims



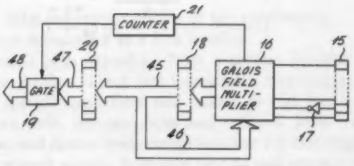
1. A multi-function box capable of being mounted in a wall for receiving electrical power from a power cable and distributing the power to a power distribution cable; a modular electric switch unit having first and second external terminals removably mounted in said multifunction box, said multi-function box including a distribution bus plate compartment and a function unit compartment in which said modular switch unit is mounted, a plurality of bus plates mounted in said bus plate compartment, automatic conductor retaining and clamping means on said bus plates, a plurality of power-input openings in said box dimensioned and positioned for receiving the stripped conductor ends of the conductors of a power cable and guiding said conductors into contact with said automatic conductor retaining and clamping means on respective ones of said bus plates as the conductor ends of a power cable are inserted through said power-input openings, each of said automatic conductor retaining and clamping means including automatically operable means permitting ready insertion of a conductor end but resisting any withdrawal of said conductor end, power distribution output openings in said box dimensioned and positioned for receiving the stripped ends of the conductors of a power distribution cable and guiding said stripped conductor ends of said power distribution cable in contact with other automatic conductor receiving and clamping means on selected ones of said bus plates, and means for providing a selectively operable electrical flow path through said modular switch unit to said power distribution cable, said last-mentioned means comprising a first bus plate having a contact element engaging said first terminal of said modular electric switch unit, a second bus plate having a contact element engaging said second external terminal, said first bus plate having automatic conductor retaining and clamping means engageable with one conductor of a power cable, said second bus plate having an automatic conductor retaining and clamping means engageable with one conductor of a distribution cable and a third bus plate having automatic conductor retaining and clamping means engageable with a second conductor of a power cable and a second conductor of a distribution cable.

4,165,444

APPARATUS FOR ELECTRONIC ENCYPHERMENT OF DIGITAL DATA

John A. Gordon, Hatfield, England, assignor to National Research Development Corporation, London, England

Filed Nov. 29, 1977, Ser. No. 855,685
Claims priority, application United Kingdom, Dec. 11, 1976, 51823/76
Int. Cl.[2] H04L 9/00
U.S. Cl. 178—22 14 Claims



14. Encyphering of decyphering apparatus comprising:

a shift register having m stages where m is a positive integer and 2^m-1 is prime, each stage having an associated respective tap connection where an output signal representative of the conduction state of that stage is, in operation, available,

first logic means, having a plurality of input terminals, for combining input signals applied to the terminals according to a first predetermined logical process,

selection means for automatically selecting tap connections and coupling the selected connections to respective inputs of the first logic means, the tap connections being so selected in accordance with the coefficients of a minimum polynomials in a Galois-field GF(2^m) that the position of the stage associated with each selected tap connection in the shift register corresponds to the position of a predetermined value of coefficient in one of the said polynomials, and

second logic means for combining digital signals which are to be encyphered or decyphered with other digital signals according to a second predetermined logical process,

which may be the same as the first logical process, the said other digital signals being related to the output signals of the first logic means,

the selection means in operation finding the said coefficients, starting from any arbitrary element b in the said field which satisfies k=m where k is the least integer with the property $b^{2^k}=b$, and the selection means being constructed

to form the Galois-field product

$$T=(b+w)(b^2+w)(b^4+w)(b^8+w)\ldots(b^{2^{m-1}}+w)$$

where b is any arbitrary element in GF(2^m) except 0 or 1, and w is a root of a primitive polynomial of degree m, and

to form the modulo-two sum of T as represented by the coefficients thereof, and the said primitive polynomial as represented by its coefficients.

4,165,445

CIRCUIT FOR PREVENTING ACOUSTIC FEEDBACK

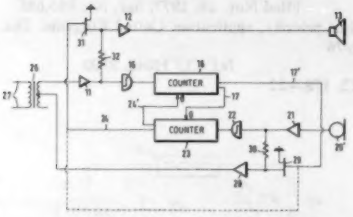
Jörgen Brosow, Hof, Austria, assignor to Dasy Inter S.A., Geneva, Switzerland

Filed Dec. 21, 1977, Ser. No. 862,673

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1976, 2659028

Int. Cl.² H04M *1/20*

U.S. Cl. 179—1 HF **11 Claims**



1. A circuit for preventing acoustic feedback in communication devices provided with at least one microphone, at least one loudspeaker and at least one telephone transformer comprising a signal circuit from and to said telephone transformer wherein the output signal from said telephone transformer fed to the loudspeaker is divided, one divided output signal is fed to at least one first analog-digital converter, the digital output signal of said first converter is supplied to a first counter cooperating with said at least one first converter, the input signal fed from said at least one microphone to said telephone transformer is divided, one divided input signal is fed to at least one second analog-digital converter, the digital output signal of said second converter is supplied to a second counter cooperating with said at least one second converter, at least one of said counters on reaching a predetermined counter state supplying a damping signal to at least one damping element within said signal circuit from and to said telephone transformer and another of said counters on reaching a predetermined counter state supplying a signal to reset the first one of said counters to a zero state, whereby when the input signal exceeds the output signal, the damping element is activated.

4,165,446

DATA TRANSMISSION SYSTEMS (USING INTERNAL SYSTEMS EQUIPMENT, SERVICES AND PROCEDURES OF TELEPHONE COMPANIES)

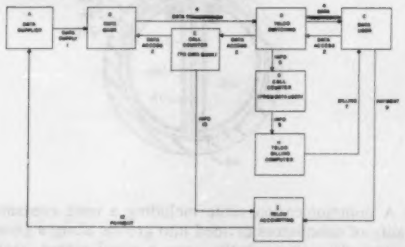
Thomas E. Flowers, 155 Jackson St., #2003, San Francisco, Calif. 94111, and Gordon S. MacDonnell, 2 Everson St., San Francisco, Calif. 94131

Filed Apr. 8, 1977, Ser. No. 785,874

Int. Cl.² H04M *11/00, 15/00, 15/16*

U.S. Cl. 179—2 DP **4 Claims**

FLOW CHART ALTERNATIVE 1



1. A method of acessing data in a data supplier's data bank by a data user and transmitting that data from the data bank to the data user which comprises:

a. accessing said data supplier's data bank and signalling the data desired, by using the data user's data access terminal equipment to make a request for data;

b. transmitting said data request from the data user to the data supplier through telephone operating company ("telco") switching equipment and transmission channels;

c. transmitting the data requested from the data supplier to the data user, in response to said data request, through telco switching equipment and transmission channels;

d. identifying the data user who made said request for data by using the telco automatic number identification ("ANI") equipment;

e. counting and timing said data request and the transmitted data by using telco call counters and timing equipment whereby said call counters and timing equipment determine and record at least one characteristic of said data request and said transmitted data selected from (1) number of requests from each data user to said data supplier, (2) number of requests from all data users to said data supplier, (3) duration of total time of calls from each data user to said data supplier, and (4) duration of total time of calls from all data users to said data supplier;

f. billing said data user for charges selected from the telco's charges and said data supplier's charges, by using means including the telco automatic billing equipment;

g. collecting said charges from said data user; and

h. transmitting said data supplier's charges collected by the telco to said data supplier.

4,165,447

CENTRALIZED DATA-REGISTRATION EQUIPMENT FOR TRAFFIC SUPERVISION IN TELECOMMUNICATION SYSTEM

Ottavio Bertoglio; Spiridione De Micheli, both of Turin, and Paolo Tiribelli, Pino Torinese-Torino, all of Italy, assignors to CSELT — Centro Studi e Laboratori Telecomunicazioni, Turin, Italy

Filed Sep. 14, 1977, Ser. No. 833,363

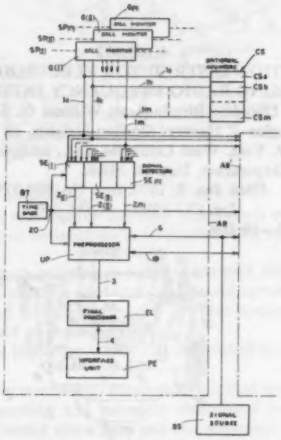
Claims priority, application Italy, Sep. 15, 1976, 69239 A/76

Int. Cl.² H04M *15/00*

U.S. Cl. 179—7.1 R **10 Claims**

1. In an apparatus for supervising the activities of different signal paths of a telecommunication system as determined by respective monitoring units, comprising a plurality of signal detectors respectively connected to said monitoring units for

receiving output voltages thereof, scanning means connected to all said signal detectors for deriving from said output voltages a recurrent TDM frame having different time slots respectively allocated to said monitoring units, discriminating means connected to said scanning means for determining the beginning and the end of an activity detected in any of said time slots, a set of counters triggerable by said discriminating means for registering numerical values respectively related to the activities detected in corresponding time slots, conversion means controlled by said discriminating means for generating code words representative of the readings of said counters and identifying the signal paths associated therewith, memory means connected to said conversion means for storing said code words, and evaluating means connected to said memory



means for comparing the contents of the stored code words with a preprogrammed set of parameters,

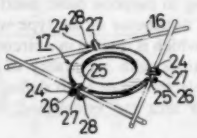
the improvement wherein said memory means comprises an accumulating memory loadable with said code words by said conversion means in response to end-of-activity signals from said discriminating means by which the respective counters are cleared, said conversion means being responsive to extraneous readout commands not resulting in a clearing of the counters for generating code words distinctively identified to bypass said accumulating memory in conveying the instantaneous readings of all said counters to said evaluating means, thereby preventing iterative inclusion of the readings of any counter in the accumulated totals.

4,165,448

LOUDSPEAKER WITH IMPROVED VOICE COIL SUPPORT

Haruo Ishikawa, 12-35-314, Matsunoki 1-chome, Suginami-ku, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,034
Int. Cl.[2] H04R *9/04*
U.S. Cl. 179—115.5 VC **4 Claims**



1. In a loudspeaker having a frame, a diaphragm attached to the frame, a center pole forming a loudspeaker magnetic field, a voice coil bobbin having a voice coil wound on the periphery thereof for driving said diaphragm in conjunction with said magnetic field and a voice coil support defined by a single suspension line, the improvement comprising:

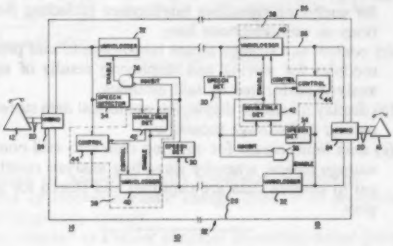
a plurality of sets of laterally spaced paired struts upstanding on said frame spaced equidistantly from the periphery of said voice coil bobbin, said suspension line having straight line spans interconnecting the pairs of struts with the spans defining an equilateral triangle from which is suspended said bobbin, said line spans of said single line extending along respective planes parallel to planes tangential to said bobbin, and rigid suspension means suspending the voice coil bobbin from said straight line spans of said single line centrally within said equilateral triangle substantially equidistant from said spans.

4,165,449

ECHO SUPPRESSOR CIRCUIT

Patrick A. Vachon, Arvada, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Jan. 3, 1978, Ser. No. 866,478
Int. Cl.[2] H04B *3/20*
U.S. Cl. 179—170.2 **11 Claims**



1. An echo suppressor circuit of the type having:

a speech transceiver at a first location;

a transmit path extending from a second location remote from the first to said first location for directing an incoming speech signal from said second to said first location;

a return path, separate from said transmit path, extending from said first to said second location for directing outgoing speech signals from said first to said second location, said incoming speech signals being reflected from said first to said second location along said return path;

a first speech detector responsive to the presence of incoming speech signals on said transmit path; and

a first suppressor means responsive to said first speech detector for reducing the amplitude of said reflected signal when said incoming signal is present on said transmit path, the improvement comprising:

a second speech detector responsive to the presence of outgoing signals on said return path;

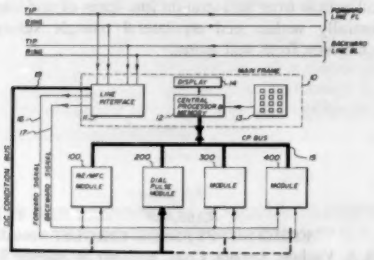
means responsive to said second speech detector inhibiting said first suppressor means when said outgoing signal is present on said return path; and

a second suppressor means responsive to both said incoming and outgoing signals and to both said first and said second speech detector for reducing the amplitude of said incoming signal by an amount which varies as a function of the relative amplitudes of said incoming and outgoing signals with respect to one another whenever said incoming and outgoing signals are simultaneously occurring.

4,165,450
TELEPHONE SIGNALLING TEST SYSTEM

C. Terry Throop, Concord; Richard E. Moffett, Portsmouth; John R. Hemmert, Nashua, and Robert E. Sawyer, Jr., Epsom, all of N.H., assignors to Northern Telecom Inc., Ottawa, Canada

Filed May 17, 1978, Ser. No. 906,914
Int. Cl.[2] H04M 3/22
U.S. Cl. 179—175.2 C 11 Claims



1. Signalling test apparatus for monitoring a voice frequency telephone line and the like comprising:

(a) interface means for accessing said telephone line in parallel without disrupting its normal operation;

(b) a plurality of modules responsive to said interface means for analyzing signalling intelligence including d-c conditions on said telephone line;

(c) control and storage means responsive to said plurality of modules for storing and displaying results of signalling analysis performed by said modules;

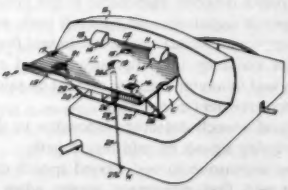
(d) display means for displaying numerical data stored in said second and storage means; and

(e) data input means for entering data into said control and storage means, whereby signalling analysis results identical to entered data are captured and stored for later display.

4,165,451
NOTE PAD SUPPORTS FOR DESK TELEPHONES

Irving Einstein, Miami Beach, Fla., assignor to Ruth Astor, Boulder, Colo. and Estelle Goldberg, Silver Springs, Md.

Continuation-in-part of Ser. No. 843,201, Oct. 18, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,626
The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.
Int. Cl.[2] H04M 1/21
U.S. Cl. 179—178 10 Claims

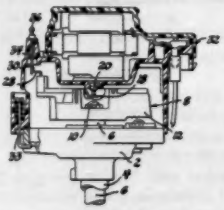


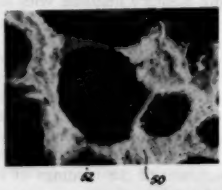
1. A desk telephone accessory comprising a flat platform sized to extend along the rear of a desk telephone base and have a front edge portion resting on the hand set cradle and to extend horizontally rearwardly to support a note pad thereon, said front edge portion being formed with a pair of spaced cutout openings for engaging the horns of the rear pair of cradle posts of said base, brace means extending from a bottom side of the platform forwardly and downwardly to engage said telephone base, a tie attached to said bottom side of the platform and terminating in a hook for engaging the bottom edge of a skirt of said telephone, said brace means and horn engagement in the cutout openings supporting said platform in said horizontal position for writing on said note pad positioned on the platform, and said tie exerting a downward force on said platform against said brace means securing the platform against dislodgement.

4,165,452
IGNITION DISTRIBUTOR ELECTRODE FOR SUPPRESSING RADIO FREQUENCY INTERFERENCE

William C. Olander, Birmingham; William G. Trabold, Royal Oak; Douglas J. Harvey, Sterling Heights, all of Mich., and Robert W. Vest, West Lafayette, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 9, 1978, Ser. No. 868,079
Int. Cl.[2] H01H 19/00, 1/00
U.S. Cl. 200—19 DR 5 Claims





1. In an ignition distributor system for an internal combustion engine of the type wherein a high voltage is produced for an engine spark plug by a high voltage electrical discharge across a gap between a distributor electrode and a spark plug lead terminal, the improvement wherein,

at least an end portion of said electrode adjacent said gap consists essentially of interspersed phases of a dielectric material and an electrically conductive material, a portion of said dielectric material protruding from the end of said electrode into said gap, promoting breakdown across the gap and tending to suppress radio interference.

2. In an ignition distributor of the type wherein a rotating electrode has a tip which is rotated in a circumferential path to successive registrations with a plurality of circumferentially spaced stationary electrodes so as to define successive radial gaps across which arcs are established, the improvement wherein,

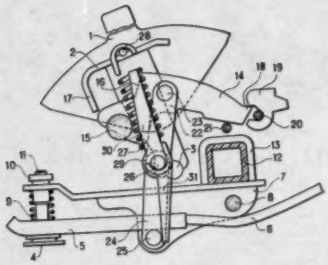
the tip is composed of interspersed phases of a conductive material and a dielectric material, the dielectric material protruding from the conducting material to define a nonuniform electric field which encourages breakdown across the gap and tends to suppress radio interference.

4,165,453

SWITCH WITH DEVICE TO INTERLOCK THE SWITCH CONTROL IF THE CONTACTS STICK

Jean Hennemann, Hombliéres, France, assignor to Societe Anonyme dite: UNELEC, Paris, France

Filed Jul. 28, 1977, Ser. No. 820,026
Claims priority, application France, Aug. 9, 1976, 76 24276
Int. Cl.[2] H01H *3/00, 25/00, 21/04*
U.S. Cl. 200—153 G 5 Claims



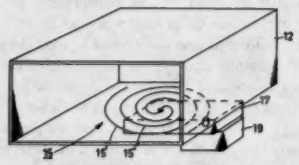
1. A switch comprising:
an operating arm rigidly attached to a switch control, and able to move between a closed position and an open position,
moving contacts working in conjunction with fixed contacts to open or close an electrical circuit, said moving contacts being fitted on a drive arm able to move between a closed position and an open position,
an automatic trip lever which can be latched in an engaged position,
a quick-acting mechanism comprising a spring and a knuckle joint connecting rod assembly articulated between the moving contact drive arm and the automatic trip lever, said connecting rod assembly comprising a central link pin to which one end of said spring is coupled,
means for interlocking the switch control if the contacts stick, comprising a locking lever controlled by a stop linked to the operating arm and resting on a second stop, linked to the moving contact drive arm when this arm is not in the open position, said locking lever consisting of a two-arm lever having two arms pivoting about said central link pin of said connecting rod assembly.

4,165,454

MICROWAVE OVEN

Kurt H. Carlsson; Bengt U. Imberg, both of Norrkoping, Sweden; Frans C. de Ronde, Eindhoven, Netherlands, and Jan O. Appelquist, Norrkoping, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,976
Claims priority, application Sweden, Nov. 7, 1975, 7512484; Jul. 15, 1976, 7608087
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 F 21 Claims



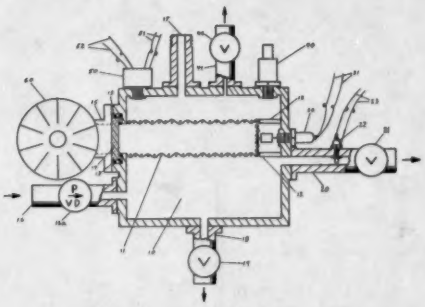
1. A microwave oven comprising opposed top and bottom wall surfaces and interconnecting side wall surfaces defining an oven cavity, a microwave energy source coupled to the oven cavity via a feeding system which is arranged to directly supply energy via a central feeding point to a dielectric load substance to be placed in the oven cavity above the feeding system, the feeding system comprising an energy radiating transmission line in the form of a flat wire or strip conductor configuration which is located adjacent to the bottom wall of the oven cavity parallel to and near a conductive flat plate arranged below said transmission line, and wherein the flat wire or strip conductor configuration extends substantially symmetrically with respect to the central energy feeding point over substantially the entire surface of said bottom wall of the oven cavity.

4,165,455

STEAM OR HOT-WATER BOILER

Esther O. Mayfield, 5565 Thunderbird La., La Jolla, Calif. 92037

Filed Jul. 28, 1977, Ser. No. 819,877
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 A 7 Claims



1. A steam or hot-water boiler apparatus comprising:
a source of electromagnetic energy capable of producing high frequency energy,
a vessel adapted as a boiler chamber to contain water during heating, feedwater inlet and water outlet means connected to said chamber, said inlet and outlet being connected to a source of feedwater and to a conduit for leading heated water to a place of use respectively, said inlet and outlet having water-tight connections with respect to said chamber, a grid wire resonant cavity providing means for confining energy while heating water and releasing steam into the steam side of the boiler chamber, a main header to collect steam at the steam side of said chamber,
means for coupling energy from the source to said cavity, said means having water-tight connection with said cavity.

4,165,456

DEVICE FOR HEATING TO CONSUMPTION TEMPERATURE A LIQUID COMMESTIBLE PRODUCT SEALED IN A DISPOSABLE CONTAINER

Amilcare Dogliotti, Alba, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy

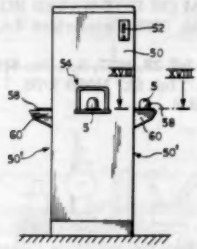
Filed Oct. 2, 1978, Ser. No. 947,323
Claims priority, application Italy, Oct. 14, 1977, 69296 A/77; May 8, 1978, 68041 A/78; May 18, 1978, 68136 A/78
Int. Cl.[2] H05B *3/68*
U.S. Cl. 219—449 13 Claims

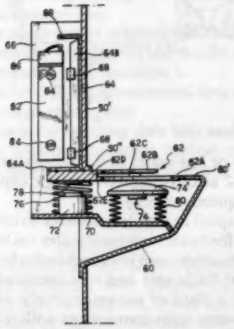
1. Device for heating to consumption temperature a liquid commestible product while the latter is sealed in a disposable shaped container having a heat-conductive wall portion, comprising:
(i) a normally open electric switch,
(ii) a yieldably supported heating plate having a heating face and a PTC heating resistor energizable via said switch,

(iii) a spring-biased presser member formed with a container-receiving seat located above said heating face, said member being manually depressable against the action of its bias spring from a loading position spaced above said face to a working position to bring said wall portion of the container into forced pressure-engagement with the heating face,

(iv) the said normally open electric switch being closable by displacement of the presser member to said working position,

(v) a fixed electromagnet unit energizable by closure of the switch and a movable armature for said electromagnet unit carried by the presser member in a mutual relation such that the presser member is kept in its working posi-





tion by the electromagnet unit when the latter is energized,

(vi) an electric control circuit controlling heating current supply to the PTC resistor from said switch when the latter is in closed condition, said control circuit comprising circuit means sensitive to the instantaneous resistance value of the PTC resistor in energized condition thereby to interrupt the said heating current supply each time the temperature of the resistor rises to a predetermined maxim value and to restore said current after a fraction of the total heating time,

(vii) and a timer circuit triggerable by the closure of said switch, determining the total heating time and arranged to open said switch at the elapse of the total heating time.

4,165,457

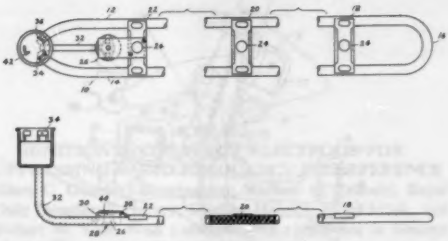
THERMOSTATICALLY CONTROLLED PRE-WELD HEATER

Gordon W. Turcotte, Gorham, Me., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Jan. 19, 1978, Ser. No. 870,892
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—516 **2 Claims**

1. An electrical heater for preheating a localized area to be welded of a parent metal comprising an electrical heating coil embedded in magnesium oxide and disposed within a metallic sheath having electrical connections for connecting said coil to a source of electrical power, said sheath having a flattened bottom portion adapted to increase the amount of surface contact between said bottom portion of said sheath and said parent metal,

an integrally connected and mounted thermostatic control element positioned to contact said parent metal in the area where said weld is to be made, said thermostatic control element being connected to said electrical heating coil to



open and close the electrical connection to the heating coil about a preselected temperature; and

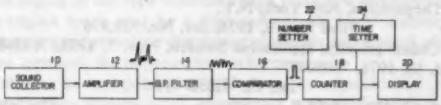
mounting brackets for attaching said heater to said parent metal and further including a sensor mounting bracket attached to one of said mounting brackets, said thermostatic control element being attached to said sensor bracket to position said thermostatic control element in direct contact with said parent metal in said localized area where said weld is to be made.

4,165,458

SIGNAL DECISION SYSTEM

Takayuki Koizumi, and Teruo Usami, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,454
Claims priority, application Japan, Apr. 23, 1976, 51-46845
Int. Cl.[2] G06M *3/02*
U.S. Cl. 235—92 PE **14 Claims**

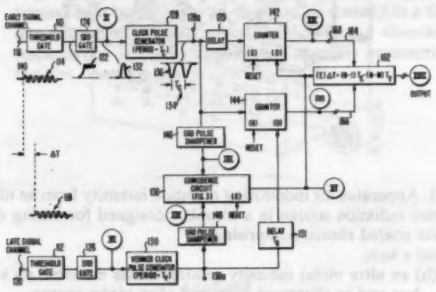


1. A signal decision system comprising, in combination, a detector means for detecting a signal from an object to be measured, a filter means connected to said detector means for filtering the output signal from said detector means, a comparison means connected to said filter means for comparing the output signal from said filter means with a reference signal for producing a pulsed signal when said output signal from said filter means has a level not less than a predetermined level, and a decision generation means connected to said comparison means for counting said pulsed signals successively produced from said comparison means for producing a decision signal when the counted number of said pulsed signals equals at least a predetermined value within a predetermined time interval.

4,165,459
TIME INTERVAL MEASUREMENT

Walter R. Curtice, West Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,643
Int. Cl.[2] G01R *23/02;* H03K *21/30*
U.S. Cl. 235—92 TF 7 Claims



1. An apparatus having first and second input terminals adapted to received thereat an early pulse and a late pulse, respectively, comprising in combination:

means responsive to the receipt of said early pulse at said first input terminal for producing a first series of said clock pulses of predetermined period T_C, the first pulse therefrom correlated to the occurrence of said early pulse at said first terminal;

first counting means responsive to said first series of pulses from said clock pulse means for counting said pulses of said first series and for producing a signal indicative of the count;

second counting means also responsive to said first series of pulse from said clock pulse means for counting said pulses of said first series and for producing a signal indicative of the count;

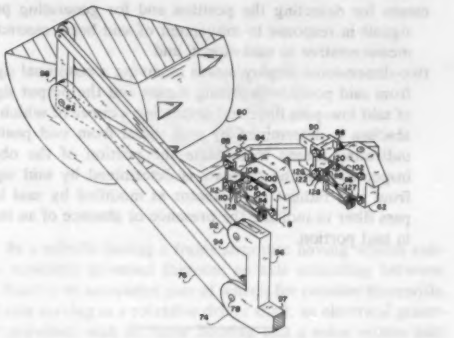
means responsive to the receipt of said late pulse at said second input terminal for producing a second series of clock pulses of predetermined period, T_V, where $T_V < T_C$, the first pulse therefrom occurring when a number, M, of said first series of clock pulses have been produced, said first pulse correlating to the occurrence of said late pulse at said second input terminal, said first counting means having a terminal receptive of said first pulse of said second series for becoming disabled from further counting while producing a signal representative of said number, M; and

means responsive to pulses from said means producing said first and second series of pulses, respectively, for producing a pulse indicative of the first coincidence of a pulse in said first series and a pulse in said second series, said first coincidence occurring when a number N, of said first series of clock pulses have been produced and when said second means for counting is producing a signal representative of said number N, whereby the values of M, N, T_C and T_V may be utilized to measure the time interval between the arrival of the early pulse and late pulse.

4,165,460
COAL-ROCK INTERFACE DETECTOR

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Stephen D. Rose; Charles E. Crouch, both of Huntsville, Ala., and Elborn W. Jones, Mississippi State, Miss.

Filed Nov. 4, 1977, Ser. No. 848,793
Int. Cl.[2] G01V *5/00;* G01N *23/20*
U.S. Cl. 250—253 5 Claims



1. A coal-rock interface detector comprising:

a source of gamma radiation;

a radiation detector;

a frame;

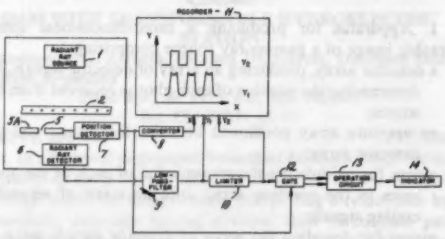
first support means mounted on said frame for independently, and vertically variably, positioning said source of gamma radiation adjacent to a coal surface as said frame is moved along the coal surface;

second support means mounted on said frame, independent of said frame and independent of the position of said source of gamma radiation, for vertically variably, positioning said radiation detector adjacent to said coal surface as said frame is so moved along the coal surface.

4,165,461
DETECTING APPARATUS FOR INSERTS, THICKNESS UNEVENNESS OR IMPURITIES

Hiroshi Ishijima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jun. 23, 1977, Ser. No. 809,437
Claims priority, application Japan, Jun. 23, 1976, 51-74162
Int. Cl.[2] G01N *23/00;* G02B *5/00*
U.S. Cl. 250—359 12 Claims



1. Apparatus for inspecting an object to detect inserts therein comprising:

a radiant ray source for directing a beam of radiant rays toward an object to be inspected,

a radiant ray detector disposed at the opposite side of said object from said radiant ray source in position to receive radiant rays transmitted through said object,

a low-pass filter for smoothing a pulse-form intensity signal from said radiant ray detector,

means interposed between said radiant ray source and said radiant ray detector to restrict said beam of radiant rays to a fine beam of parallel rays, said beam restricting means being movable relative to said object so as to scan said object whereby rays transmitted through different parts of said object are detected successively by said radiant ray detector,

means for detecting the position and for generating pulse signals in response to movement of said beam restricting means relative to said object, and

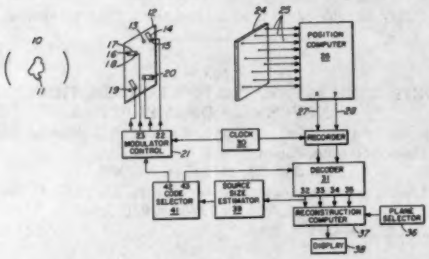
two-dimensional display means receiving a positional signal from said position detecting means and the output signal of said low-pass filter and displaying a curve of which the abscissa is determined by said signal from said position indicating means to indicate the portion of the object inspected and the ordinate is determined by said signal from said radiant ray detector as modified by said low-pass filter to indicate the presence or absence of an insert in said portion.

4,165,462

VARIABLE CODE GAMMA RAY IMAGING SYSTEM

Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025, and Dov Rosenfeld, 260 San Jose Ave., San Francisco, Calif. 94110

Filed May 5, 1977, Ser. No. 794,117
Int. Cl.[2] G01T *1/20*; G01N *21/34*
U.S. Cl. 250—363 S **14 Claims**



1. Apparatus for producing a three-dimensional tomographic image of a gamma-ray source comprising:

a detector array, producing an array of detector signals, for determining the position of each photon received from the source;

an aperture array positioned between the source and the detector array;

means for modulating the transmission of each of the apertures in the aperture array with an array of separable coding signals;

means for decoding the array of detector signals using an array of decoding signals which correspond to the separable coding signals to provide an array of projection signals representing the intensity of a projected image of the source through each aperture;

means for choosing the coding and decoding signals based on the intensity distribution of the source; and

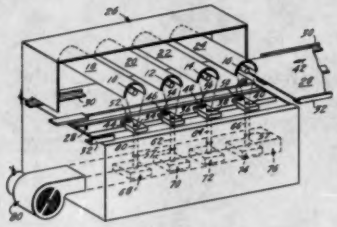
means for utilizing the projection signals to produce a three-dimensional tomographic image of the source.

4,165,463

RADIATION MONITORS AND METHOD FOR POSITIONING

William E. Bowen, Trenton, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Sep. 27, 1977, Ser. No. 837,020
Int. Cl.[2] G01J *1/42*; G01N *21/00*
U.S. Cl. 250—372 **5 Claims**



1. Apparatus for monitoring radiation intensity from an ultra violet radiation source in a chamber designed for curing discrete coated sheets, comprising:

(a) a box;

(b) an ultra violet intensity sensing means mounted on said box and in alignment with said ultra violet source;

(c) a conveying surface mounted on said box between said ultra violet source and said ultra violet sensor and wherein said surface is substantially normal to an axis aligning said ultra violet source with said ultra violet sensing means;

(d) an ultra violet receptor mounted beneath but proximate to said conveying surface; and in alignment with said ultra violet sensing means and said ultra violet source;

(e) an ultra violet transmitting means with a first end and a second end wherein said first end is received within said ultra violet receptor and said second end is in communication with said ultra violet sensing means; and

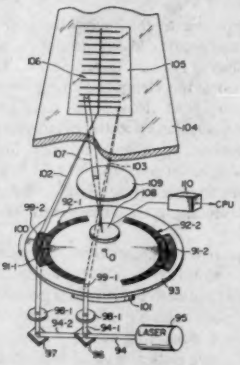
(f) means for cooling said ultra violet sensing means.

4,165,464

LIGHT SCANNING SYSTEM

Hiroyuki Ikeda, Yokohama; Moritoshi Ando, Tokyo, and Takefumi Inagaki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Jun. 3, 1976, Ser. No. 692,350
Claims priority, application Japan, Jun. 10, 1975, 50/70378
Int. Cl.[2] G02B *21/38*
U.S. Cl. 250—550 **27 Claims**



1. A light scanning apparatus comprising:

a circular disk having a plurality of first zone-type lenses and a plurality of second zone-type lenses, each of the first

zone-type lenses converging a first incoming light beam toward a corresponding first focal point and each of the second zone-type lenses converging a second incoming light beam toward a corresponding second focal point,

light beam source means for providing both said first light beam and said second light beam, and for directing said first light beam and said second light beam, respectively, onto points different from each other on said circular disk so that said first and second light beams illuminate said first and second zone-type lenses, respectively, and

motive means for providing relative motion between said light beam and both said first and second zone-type lenses, respectively, whereby each of said corresponding converged light beams scans an object to be scanned in a first scanning direction and in a second scanning direction, respectively, said second scanning direction intersecting the first scanning direction.

4,165,465

SYSTEM FOR CHECKING PRINTED CONDITION OF PRINTED SHEET MATTERS

Masataka Kanatani, Tokyo, and Daikichi Awamura, Kawasaki, both of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1977, Ser. No. 823,108

Claims priority, application Japan, Aug. 10, 1976, 51/95182; Aug. 17, 1976, 51/97967; Aug. 27, 1976, 51/102235

Int. Cl.[2] G01N *21/30*

U.S. Cl. 250—559 **22 Claims**

1. A system for checking printed condition of multicolor printed sheet matters, said system comprising:

a check mark on at least one corner of each of said sheet matters, said check mark including stripes corresponding to each color printed;

a counting machine for separating said sheet matters one by one and exposing said corner having said check mark;

a density signal generator comprising a photoelectric element which scans said check mark separated and exposed by said counting machine to provide as an output a density signal of the check mark;

a density signal processor which analyzes and processes said density signal from said density signal generator to generate a pulse output which indicates the position of said stripes;

a computer which is operative to inspect for presence of said pulse signal from said density signal processor to detect missing print; and

an indicator which indicates the printed sheet matter having the missing print detected by said computer.

4,165,466

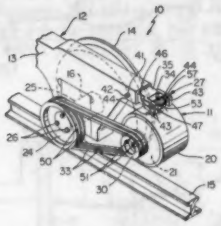
DRIVE APPARATUS FOR VEHICLE MOUNTED GENERATOR

Tieme C. Stikkers, Brookline Station, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed May 25, 1977, Ser. No. 800,490

Int. Cl.[2] F16H *7/10*

U.S. Cl. 290—3 **16 Claims**



1. In a vehicle having a frame structure having wheels suitably rotatably mounted thereon; an axle extending between and fixed to an associated pair of wheels for rotation therewith, said axle serving as a rotatable driver shaft; an electrical generator provided with an outer housing and a rotor within said housing; and a drive apparatus for said generator comprising a driver sheave carried and driven by said driver shaft, a driven sheave fixed to said rotor, and belt means operatively connected between said drive sheave and said driven sheave; the improvement in said apparatus comprising, a telescoping member adapted to be received in telescoping relation within said frame structure; adjustable pivot support means supporting said generator on said vehicle, said adjustable pivot support means comprising a pin carried by said telescoping member, and lug means on said outer housing having opening means therein for receiving said pin therethrough; said adjustable pivot support means enabling alignment of said generator so that said driven sheave is precisely aligned with said driver sheave; and torsion spring means yieldingly moving said generator about its pivot support means thereby moving said driven sheave away from said driver sheave and placing a substantially constant yielding tension on said belt means to assure said driven sheave and generator are driven in an optimum manner.

4,165,467

DAM WITH TRANSFORMABLE HYDROELECTRIC STATION

Francisco J. G. Atencio, Estafeta Dr. Garcia, Diamante Entre Rios, Argentina

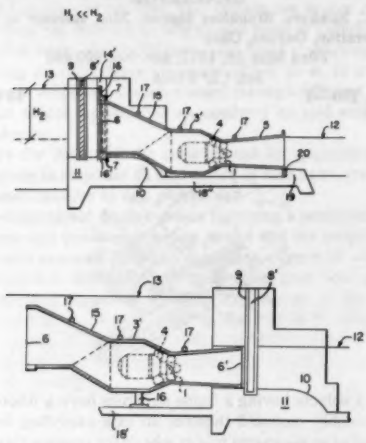
Filed Apr. 29, 1977, Ser. No. 792,492

Int. Cl.[2] F01D *15/10*

U.S. Cl. 290—52 **14 Claims**

1. In a dammed engineered watershed having a water storing plurality of dams having means for directing a flow of water through them; the improvement comprising a removable hydromotive assembly having a water flow circulation path defined by a conduit having a lateral wall for directing water through an incorporated energy generation unit for causing actuation thereof; and having a first open end and a second open end for discharging the water entering the first open end, at least one of said open ends being adapted to be positioned coincidently against at least one end of said dams water directing means; and means for permitting said removable hydromotive assembly to be displaced away from one of the ends of one

dam of said plurality of water storing dams; to be positioned coincidently in combination at another end of the same or



another dam of said plurality of water storing dams, for purposes of energy production.

4,165,468

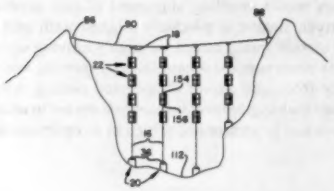
WIND DRIVEN, HIGH ALTITUDE POWER APPARATUS

Charles M. Fry, 17144 E. Brown Cir., Aurora, Colo. 80013, and Henry W. Hise, 2209 Hancock Dr., Austin, Tex. 78756

Division of Ser. No. 650,186, Jan. 19, 1976, Pat. No. 4,084,102. This application Mar. 7, 1978, Ser. No. 884,134

Int. Cl.[2] F03D *11/00*

U.S. Cl. 290—55 **9 Claims**



1. Apparatus for harvesting energy from high velocity winds found at great heights above the ground, comprising:

an elongated, relatively flexible drive shaft having opposed ends, a ground supported energy conversion device for generating power, a plurality of wind driven vertical axis rotors for driving said shaft, each of said rotors having a plurality of blades circumferentially spaced about the vertical axis thereof for imparting rotational motion into each of said rotors, a shaft swivel means, and an aerial support means by which said swivel means can be supported within the atmosphere at great height above-said energy conversion device;

means connecting one end of said shaft to said energy conversion device such that rotation of said shaft operatively actuates said energy conversion device to thereby generate power; means connecting each of said rotors to said shaft with said shaft being connected through the central axis of each of said rotors, thereby enabling the blades of each of said rotors to rotate about the vertical axis thereof while rotating said shaft; means by which said shaft is supported from said aerial support means by said shaft swivel means such that each of said rotors impart relative rotational motion into said shaft respective to said aerial support means in response to the winds aloft blowing thereacross, said shaft being the sole means by which said wind driven vertical rotor rotors are supported from said aerial support means;

said aerial support means includes an elongated suspension member having opposed ends which are anchored to spaced adjacent structure supported from the earth; said swivel means being supported by a midportion of said suspension member;

said means connecting said rotors to said shaft includes a one-way clutch means which causes a relatively slow rotating one of said rotors to be disengaged from the shaft when the wind causes a relatively fast rotating one of said rotors to rotate said shaft at a rotational speed greater than the speed of said slow rotating one of said rotors.

4,165,469

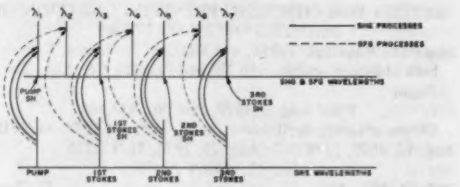
APPARATUS AND METHOD FOR PRODUCING VISIBLE COHERENT LIGHT AT A PLURALITY OF WAVELENGTHS

Eugene O. Ammann, Los Altos, Calif., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 21, 1978, Ser. No. 935,216

Int. Cl.[2] H03F *7/00*

U.S. Cl. 307—426 **10 Claims**



1. Pulsed tunable laser apparatus having outputs in the visible optical wavelengths comprising

a laser having

a lasing medium,

means to excite said lasing medium whereby to produce a pump beam of coherent light having a wavelength λ_p greater than 8000 A (near infrared), and

first and second laser mirrors spaced from opposite sides respectively of said medium and traversing said beam whereby to define the laser cavity,

switch means in said laser cavity operative on said beam,

means to activate and deactivate said switch means whereby to produce a succession of pulses of said coherent light,

a non-centrosymmetric crystal between said lasing medium and said second mirror and positioned to be traversed by said light pulses whereby to cause stimulated Raman scattering (SRS) of the light and thereby to produce Stokes wavelengths, said crystal having an optic axis and an angle θ with respect to the pulsed beam propagation direction within the crystal,

means to adjustably support said crystal for movement relative to said pulsed beam whereby θ is selectively changeable, and

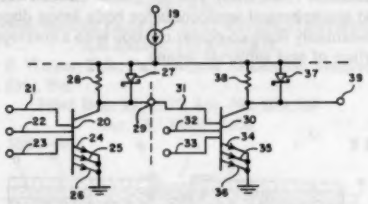
means to cause said Raman scattered light to oscillate through said crystal comprising at least one of said mirrors whereby to produce visible light outputs having a plurality of wavelengths corresponding to a like plurality of values of θ,

said mirrors being non-transmissive at λ_p and at said Stokes wavelengths, at least one of said mirrors being transmissive at visible light wavelengths between 4000 and 7000 A whereby coherent light in the latter wavelength range is outputted from said apparatus.

4,165,470
LOGIC GATES WITH FORWARD BIASED DIODE LOAD IMPEDENCES

David E. Fulkerson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 20, 1976, Ser. No. 724,791
Int. Cl.[2] H03K 19/08; H01L 27/04
U.S. Cl. 307—215 34 Claims



14. A circuit for performing logical functions including a NOR function, said circuit comprising:

a first gate circuit comprising:

a plurality of first bipolar transistors, including a first bipolar transistor, each having a collector, an emitter and at least one base therein such that said collector and said base in each are separated by a collector-base semiconductor junction and such that said emitter and said base in each are separated by an emitter-base semiconductor junction, said first plurality bipolar transistor collectors being in direct electrical contact with one another, said first plurality bipolar transistor emitters being in direct electrical contact with one another, said first bipolar transistor emitter being directly electrically connected to a first terminal means adapted for electrical connection to a current source and said first bipolar transistor base being an input to receive signals from sources of signals; and

a first rectifying diode means having a current rectification capability between a pair of electrical termination regions therein with one of said electrical termination regions being electrically connected to said first bipolar transistor collector so that any current, flowing in a forward direction through said first rectifying diode means and jointly flowing in said first bipolar transistor collector and emitter, flows in said first bipolar transistor in a reverse direction across said collector-base junction thereof and in a forward direction across said emitter-base junction thereof, and with that remaining one of said first rectifying diode means electrical termination regions being electrically connected to a second terminal means adapted for connection to said current source, whereby a logic gate circuit capable of performing said NOR function is provided with said first transistor collector serving as an output for said first gate circuit;

a second gate circuit comprising:

a second bipolar transistor having a collector, an emitter and at least one base therein such that said collector and said base are separated by a collector-base semiconductor junction and such that said emitter and said base are separated by an emitter-base semiconductor junction, said second bipolar transistor emitter being directly electrically connected to said first terminal means and said second bipolar transistor base being an input to receive signals from sources of signals; and

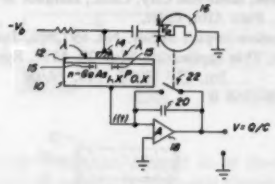
a second rectifying diode means having a current rectification capability between a pair of electrical termination regions therein with one of said electrical termination regions being electrically connected to said second bipolar transistor collector so that any current, flowing in a forward direction through said second rectifying diode means and jointly flowing in said second bipolar transistor collector and emitter, flows in said second bipolar transistor in a reverse direction across said collector-base junction thereof and in a forward direction across said emitter-base junction thereof, and with that remaining one of said second rectifying diode means electrical termination regions being electrically connected to said second terminal means, there being a direct electrical connection between said first and second rectifying diode means along said second terminal means; and

a direct electrical connection between said first gate circuit output and said second gate circuit input.

4,165,471
OPTICAL SENSOR APPARATUS

Richard K. Ahrenkeil, Los Alamos, N. Mex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,693
Int. Cl.[2] H03K 3/42; H01L 29/78, 27/14, 31/00
U.S. Cl. 307—311 6 Claims



1. Light sensing metal-oxide-semiconductor (MOS) apparatus comprising:

(a) a bulk of impurity-doped GaAsP;

(b) an electrically nonconductive natively-grown oxide of GaAsP covering part of said bulk;

(c) electrically conductive means covering at least part of said electrically nonconductive oxide of GaAsP, thereby to form a capacitor comprised of said bulk, said electrically nonconductive oxide, and said electrically conductive means, said oxide and said electrically conductive means being adapted to allow light to enter said bulk;

(d) means for applying a bias voltage to said conductive means for depleting majority carriers from the interface between said electrically nonconductive oxide and said bulk;

(e) means for applying a voltage pulse to said electrically conductive means, said pulse being of a polarity to inject majority carriers into the depletion region;

(f) an electrical conductor in contact with said bulk; and

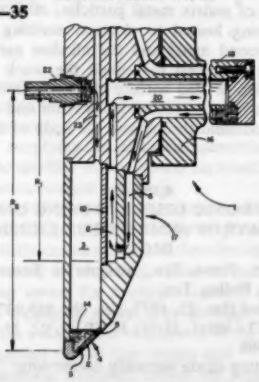
(g) means cooperative with said conductor for measuring the quantity of said injected carriers,

said GaAsP being of the form $GaAs_{1-x}P_x$, and wherein x is a number between 0.3 and 0.5.

4,165,472
ROTATING ANODE X-RAY SOURCE AND COOLING TECHNIQUE THEREFOR

David B. Wittry, Pasadena, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 12, 1978, Ser. No. 905,483
Int. Cl.[2] H01J 35/10
U.S. Cl. 313—35 22 Claims



17. A rotating anode x-ray source having an electron beam

target surface and means by which to cool said target surface thereof,

a supply of liquid within said anode and adjacent said target surface, whereby heat that is applied to said target surface causes the liquid in said anode to vaporize, and

means by which to remove the heat of vaporization from said anode, so that said target surface thereof is cooled by means of converting the liquid into vapor.

4,165,473

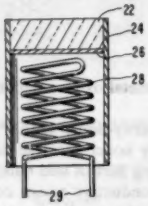
ELECTRON TUBE WITH DISPENSER CATHODE

Louis R. Falce, Redwood City, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 697,905, Jun. 21, 1976, abandoned. This application May 27, 1977, Ser. No. 800,837

Int. Cl.[2] H01J *1/14, 14/06*

U.S. Cl. 313—346 R **11 Claims**



1. An improved cathode for use in an electron tube for producing a high current density stream of electrons when heated, comprising a matrix of compacted metal particles formed with interstices therebetween which are substantially uniformly dispersed throughout the matrix and define therein an initial predetermined porosity, said matrix consisting of a mixture of metal particles of a first metal selected from the group of tungsten and molybdenum together with particles of a second metal selected from the group consisting of iridium, osmium, ruthenium and rhenium, said second metal particles comprising at least 10% to 90% by weight of said matrix, said matrix being compressed and treated to bring said particulate mixture into intimate particle-to-particle contact in which said particles are bonded together at regions of contact therein in which each metal component retains its discrete character and in which the interstices provide a substantial void volume throughout said matrix, and an electron emissive material comprising an alkaline earth aluminate including at least barium aluminate filling the interstices of said matrix to form therewith a solid cathode body of negligible porosity, said cathode body being formed with an electron emitting surface having a conformation which exposes the filled interstices and particulate matrix thereof to define, in operation, a plurality of exposed alkaline earth portions throughout the exposed surface of the mixture of matrix metal particles, said cathode being adapted for being heated to electron emitting temperature whereat the second metal and the alkaline earth aluminate interact during operation to reduce the work function for electron emission at said surface while the second metal is prevented from being sputtered away from said surface by its structural embodiment throughout the body of the cathode.

4,165,474

OPTOELECTRONIC DISPLAYS USING UNIFORMLY SPACED ARRAYS OF SEMI-SPHERE LIGHT-EMITTING DIODES

David J. Myers, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1977, Ser. No. 865,037

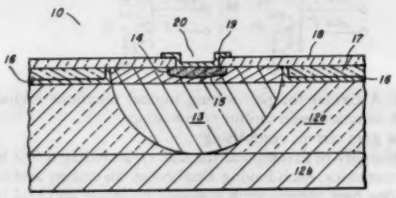
Int. Cl.[2] H01L *33/00*; H05B *33/02, 33/20*

U.S. Cl. 313—500 **17 Claims**

1. A light-emitting diode assembly comprising:

substrate means;

a radiant semiconductor diode embedded within said substrate means, said semiconductor diode including a semispherical semiconductor body of a first conductivity type and having a substantially planar circular surface and a spherical surface merging with said planar circular surface, the spherical surface of said semispherical semiconductor body being disposed within said substrate means in embedded relationship and the planar circular surface of said semispherical semiconductor body being disposed in substantially flush co-planar relation with a corresponding surface of said substrate means;



a region of a second conductivity type opposite from the first conductivity type of said semispherical semiconductor body disposed in said semispherical semiconductor body and opening onto the planar circular surface thereof, said region and said semispherical semiconductor body defining a p-n junction therebetween;

a first ohmic contact engaging said semispherical semiconductor body of the first conductivity type; and

a second ohmic contact engaging said region of the second conductivity type.

4,165,475

DISCHARGE LAMP WITH STARTER CIRCUIT

John C. Pegg, and Clive R. Walker, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Apr. 17, 1978, Ser. No. 897,631

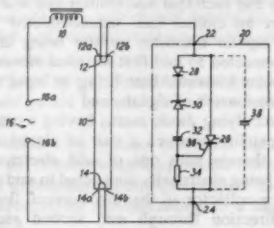
Claims priority, application United Kingdom, Apr. 18, 1977, 16044/77

Int. Cl.[2] H05B *41/18*

U.S. Cl. 315—99 **21 Claims**

1. In a discharge lamp circuit comprising a discharge lamp having a pair of cathodes, a reactive ballast, and a cyclically-varying voltage supply for said lamp and ballast, a starter circuit, wherein said starter circuit comprises:

two starter input terminals for connection to said lamp cathodes;



a controlled switch connected across said starter input terminals and having a control input; and

a control circuit connected to said control input and adapted to render said switch conductive at a desired point during the cycle of the applied voltage, said control circuit in-

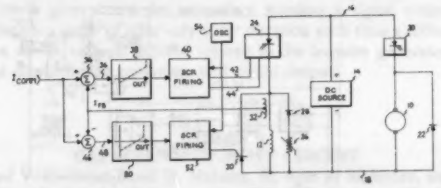
cluding a capacitor the charge upon which progressively varies with successive cycles of the applied voltage in such a manner as to cause a variation in the trigger points at which conduction occurs, whereby the instantaneous applied voltage which is required for conduction to occur increases with successive cycles of the applied voltage after switch-on of the circuit.

4,165,476

LOW LOSS, RESETTABLE EXCITATION CONTROL FOR AN INDUCTIVE LOAD

Earnest F. Weiser, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Dec. 12, 1977, Ser. No. 859,769
Int. Cl.[2] H02P 5/06
U.S. Cl. 318—493 **8 Claims**



1. In a power control system for a d-c electric traction motor having armature and field means and adapted to be energized from a source of d-c electric power, the improvement comprising:

a. controllable switching means operatively positioned between said motor and said power source, said switching means having conducting and non-conducting states for repetitively interconnecting said source and said motor;

b. first control means adapted for controlling the time ratio of conducting to non-conducting states of said switching means in a manner to regulate the magnitude of current in said motor to a desired value;

c. impedance means connected in parallel circuit arrangement with said field means;

d. controllable electric valve means connected in parallel circuit arrangement with said field means and poled to conduct current in a direction opposite to the direction of current flow through said field means; and

e. second control means for controlling the conducting and non-conducting states of said electric valve means, said second means having a first mode of operation when said load current is less than or substantially equal to said desired value of current and having a second mode of operation when said load current is greater than said desired value of current, said second control means being operative in said first mode for gating said electric valve means conductive whenever said switching means becomes non-conductive and being further operative in said second mode for controllably delaying gating of said electric valve means to thereby vary the time constant of said field means and force a more rapid decay of field current.

4,165,477

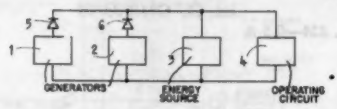
INSTRUMENT INTENDED TO BE CARRIED AT THE WRIST

Pierre Comte, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed May 18, 1977, Ser. No. 798,075
Claims priority, application Switzerland, May 21, 1976, 6468/76
Int. Cl.[2] H02J 7/00
U.S. Cl. 320—61 **3 Claims**

1. An improved instrument adapted to be carried on the wrist of a user including a rechargeable electric source for providing power for the instrument, said improvement comprising:

means for recharging said source, said recharging means including two generators, one generator generating a first charging current in response to a first physical phenomenon coupled to said source and a second generator generating a second charging current in response to a second different physical phenomenon coupled to said first generator and said source, the generators being connected in series one with another.



2. An improved instrument adapted to be carried on the wrist of a user, and including a rechargeable electric source for providing power for the instrument, the improvement comprising:

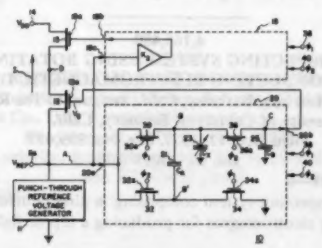
means for recharging said source, said recharging means including a photo-electric generator and a thermo-electric generator connected to provide either separately or in combination the current needed for recharging said source.

4,165,478

REFERENCE VOLTAGE SOURCE WITH TEMPERATURE-STABLE MOSFET AMPLIFIER

Walter J. Butler, Scotia, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,067
Int. Cl.[2] G05F 1/58
U.S. Cl. 323—19 **31 Claims**



1. A temperature-stable reference voltage source, devoid of passive resistance elements, comprising:

a power terminal;

means for supplying an electrical potential of unknown amplitude stability to said power terminal;

first and second output terminals;

means connected between said output terminals for generating an essentially constant coltage responsive to a flow of an essentially constant current therethrough

first means only in electrical series connection with said generating means for causing a current flow from said potential supplying means only through said generating means with a magnitude responsive to the magnitude of a signal supplied to said first means; and

temperature-stable amplifier means for supplying, respon-

sive only to the magnitude of the voltage across said output terminals, said signal to said first means to cause the magnitude of said current flow to remain essentially constant.

4,165,479

NUCLEAR MAGNETIC RESONANCE APPARATUS AND METHODS

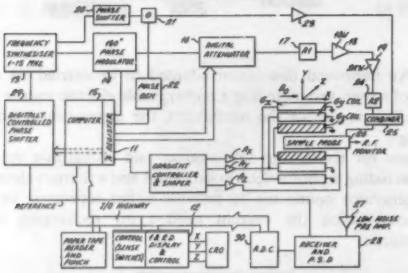
Peter Mansfield, Chilwell, England, assignor to National Research Development Corporation, London, England

Filed Dec. 13, 1977, Ser. No. 860,217

Claims priority, application United Kingdom, Dec. 15, 1976, 52322/76

Int. Cl.[2] G01R *33/08*

U.S. Cl. 324—0.5 A **21 Claims**



1. A method of obtaining signals representing the nuclear magnetic resonance spin density distribution in a sample which comprises maintaining a static magnetic field along one axis of a sample, applying an excitation pulse to the sample, applying at least one magnetic field gradient to said magnetic field which varies in a direction selected from directions orthogonal to and parallel to said one axis and repetitively reversing the direction of one or more of the said at least one magnetic field gradient at a rate which allows cyclic regrowth and decay of the free induction decay (FID) signal from the sample, and reading out the resulting FID signal.

4,165,480

PROSPECTING SYSTEM USING ROTATING SUPERCONDUCTING ELECTROMAGNETIC DIPOLE

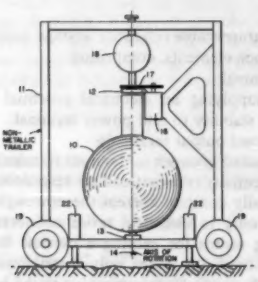
H. Frank Morrison, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 12, 1977, Ser. No. 859,477

Int. Cl.[2] G01V *308*

U.S. Cl. 324—6 **6 Claims**

1. A prospecting system c nprising: a direct current superconducting electromagnet fo producing a dipole field; means



for positioning such electromagnet close to a ground surface and continuously rotating said electromagnet and its resultant dipole around a predetermined axis; sensing means spaced from said electromagnet and close to said ground surface for measuring a predetermined component of the field in said ground induced by said rotating electromagnet.

4,165,481

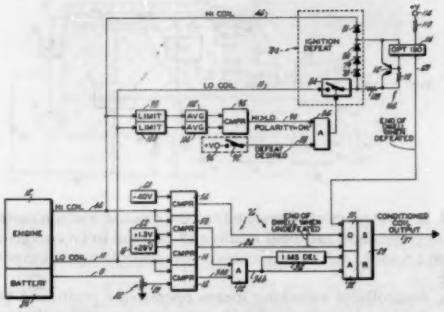
VERSATILE IGNITION DEFEAT AND SIGNAL CONDITIONING

John C. Wells, Colchester, and Paul R. Back, Somersville, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 15, 1977, Ser. No. 833,631

Int. Cl.[2] G01M *15/00*

U.S. Cl. 324—16 T **7 Claims**



1. An ignition defeat circuit for a spark ignition engine comprising a series combination including a selectively operable switch means in series with a unilaterally conductive impedance means, said series combination being adapted for connection between the high coil connection and the low coil connection of the spark ignition under test, said unilaterally conductive impedance means being poled to conduct current flowing from the primary of the ignition coil during firing time and to block current from the battery during dwell time.

2. Apparatus for selectively defeating the ignition of a spark ignition engine having an ignition cycle including alternate dwell period portion and firing time portion during diagnosis of the ignition system thereof, comprising:

a high coil signal line adapted to be connected to the battery side of the primary of the ignition coil of the engine to be tested;

a low coil signal line adapted to be connected to the ground side of the primary of the ignition coil of the engine to be tested;

a selectively operable switch means and a unilaterally conductive impedance connected in series with each other between said high coil signal line and said low coil signal line, said unilaterally conductive impedance poled to block current induced by the battery during the dwell period of the ignition cycle in which current is built up in the primary of the coil and poled to conduct current of the primary coil during firing time of the ignition cycle; and

means for selectively operating said switch means.

4,165,482

CABLE FAULT LOCATION

Philip F. Gale, Clwyd, Wales, assignor to The Electricity Council, London, England

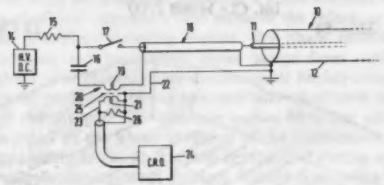
Continuation of Ser. No. 674,124, Apr. 6, 1976, abandoned. This application Jun. 13, 1978, Ser. No. 915,188

Int. Cl.[2] G01R *31/08*

U.S. Cl. 324—52 **19 Claims**

1. A method of locating a fault in a cable comprising at least two conductors which method comprises the steps of applying from an impulse generator a single voltage impulse between

two conductors of the cable, passing the resultant current waveform through a primary winding of coupling means which comprises said primary winding and a secondary winding, the primary winding being connected in series between the impulse generator and one of said two conductors, which



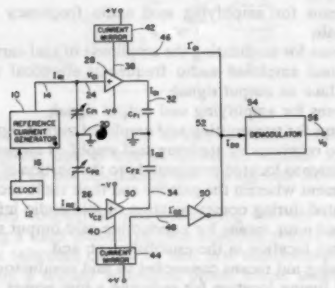
coupling means obtains the derivative of said current waveform to give across the secondary winding a signal output which is a pulse of relatively short duration each time a reflection of the voltage impulse returns to the impulse generator, and displaying or recording said signal output.

4,165,483

CAPACITIVE PICK-OFF CIRCUIT

Fred V. Holdren; Rand H. Hulsing, II, both of Redmond, and Kurt E. Steinke, Bellevue, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 31, 1978, Ser. No. 874,000
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—60 C **5 Claims**



1. A differential capacitive pick-off circuit for measuring the difference in capacitance between a first and a second capacitor comprising:

a reference current generator circuit operatively connected to the first and the second capacitors effective to apply a time varying current to each of the capacitors resulting in a time varying voltage across each of the capacitors;

a first fixed capacitor;

a second fixed capacitor;

first means for connecting the first capacitor with said first fixed capacitor resulting in said time varying voltage across the first capacitor being applied to said first fixed capacitor resulting in a current through said first fixed capacitor;

second means for connecting the second capacitor with said second fixed capacitor resulting in said time varying voltage across the second capacitor being applied to said second fixed capacitor resulting in a current through said second fixed capacitor;

means, operatively connected to said first and second connecting means, for combining at least a function of said first fixed capacitor current with at least a function of said second fixed capacitor current; and

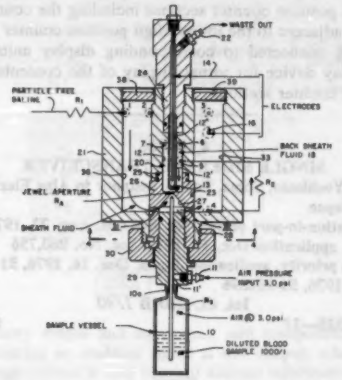
means, operatively connected to said combining means, for converting said combined current into a signal representing the difference in capacitor gaps.

4,165,484

PARTICLE COUNTING APPARATUS UTILIZING VARIOUS FLUID RESISTORS TO MAINTAIN PROPER PRESSURE DIFFERENTIALS

John L. Haynes, Redwood City, Calif., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Mar. 23, 1977, Ser. No. 780,402
Int. Cl.[2] G01N *27/00*; A61B *5/00*
U.S. Cl. 324—71 CP **34 Claims**



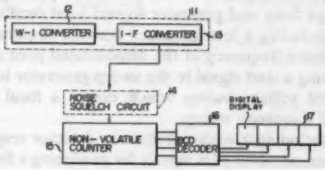
1. Apparatus for counting particles in a liquid suspension comprising: particle sensing means having a sensing aperture through which said particles pass; a vessel containing said liquid suspension; a source of particle free liquid; a small bore tube having one end immersed in said suspension and its other end juxtaposed with said aperture; means for forcing said suspension at a predetermined pressure through said tube and toward said aperture, said tube acting as a fluid resistor having a pressure drop across it such pressure drop being a significant fraction of said predetermined pressure; and hydrodynamic focusing means for directing a first flow of said particle free liquid through said aperture in cooperation with said liquid suspension said first flow being provided at substantially a pressure equal to said predetermined pressure minus said pressure drop.

4,165,485

ELECTRONIC WATT-HOUR METER

Haruo Takahashi, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 31, 1977, Ser. No. 829,573
Claims priority, application Japan, Sep. 9, 1976, 51/107232
Int. Cl.[2] G01R *21/06*
U.S. Cl. 324—142 **4 Claims**



1. An electronic watt-hour meter, comprising:

a power measuring the power to be measured and generating pulses proportional to the power;

a counter device counting each of the pulses generated by the power measuring circuit without frequency division; and

a display device visually displaying the contents of the counter device;

the counter device being provided by an N-digit decimal counter having consecutive digit position counter sections and formed of non-volatile semiconductor elements, the pulses generated by the power measuring circuit being supplied to the lowest digit position counter section of the N-digit decimal counter, the n number of lowest digit position counter sections acting as a frequency divider and being disconnected from said display device to retain the lowest digits which are not displayed, and consecutive digit position counter sections including the counter section adjacent to the lowest digit position counter sections being connected to corresponding display units of the display device for visual display of the contents of said digit counter sections.

4,165,486

SINGLE SIDEBAND TRANSCEIVER

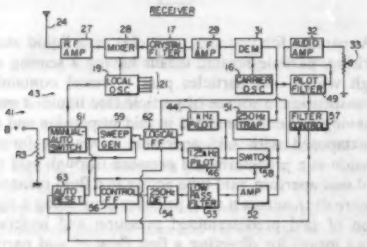
Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 826,408, Aug. 22, 1977. This application Dec. 15, 1977, Ser. No. 860,756

Claims priority, application Japan, Dec. 16, 1976, 51-151395; Dec. 16, 1976, 51-151396

Int. Cl.[2] H04B *1/40*

U.S. Cl. 325—17 **6 Claims**



1. A transceiver comprising:

a transmitter unit; and

a receiver unit for receiving a channel signal modulated with first and second pilot signals of first and second predetermined frequencies, respectively, the receiver unit including:

a voltage controlled local oscillator for generating a local oscillator signal;

a mixer means for mixing the local oscillator signal with the modulated channel signal;

a demodulator means for receiving the signal from said mixer means for demodulating it to obtain said pilot signals;

a voltage sweep generator and means for applying a control voltage from said generator to said local oscillator;

means including a first frequency detector responsive to the difference frequency of the demodulated pilot signals for applying a start signal to the sweep generator to initiate a control voltage sweep which causes a local oscillator signal frequency sweep;

means including a second frequency detector responsive to the demodulated pilot signals for producing a first control signal in response to the first predetermined frequency;

means including a third frequency detector responsive to the demodulated pilot signals for producing a second control signal in response to the second predetermined frequency; and

a sweep control means connected to the sweep generator for interrupting the voltage sweep and maintaining the control voltage constant in response to the first and second control signals in simultaneity.

4,165,487

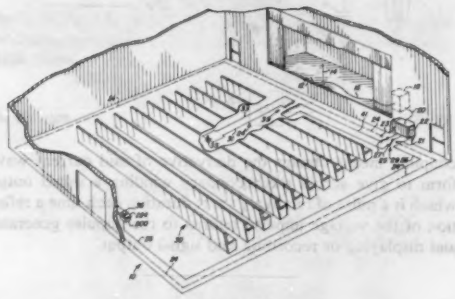
LOW POWER SYSTEM AND METHOD FOR COMMUNICATING AUDIO INFORMATION TO PATRONS HAVING PORTABLE RADIO RECEIVERS

Roy C. Corderman, 9209 Long Hills Dr., Sun City, Ariz. 85351

Filed Apr. 10, 1978, Ser. No. 895,005

Int. Cl.[2] H04B *1/00*

U.S. Cl. 325—54 **13 Claims**



1. A system for communicating audio information to a plurality of patrons of an establishment, each of the patrons having a portable radio receiver, said system comprising in combination:

(a) means for producing a radio frequency carrier signal;

(b) means for producing audio frequency electrical signals representative of information to be communicated to the patrons;

(c) means for amplifying said audio frequency electrical signals;

(d) means for modulating the amplitude of said carrier signal by said amplified audio frequency electrical signals to produce an output signal;

(e) means for amplifying said output signal;

(f) means for transmitting said amplified output signal to said radio receivers by applying said amplified output signal to an antenna located proximately to the portion of the establishment wherein the patrons and their radio receivers are located during communication of said audio information;

(g) conductor means for conducting said output signal to a tuning location in the establishment; and

(h) tuning aid means connected to said conductor means at said tuning location for radiating a low power amplitude modulated radio frequency signal of the same carrier frequency as said output signal at substantially lower field intensity then said amplified output signal to enable the patrons of the establishment to conveniently tune their portable radio receivers to said carrier frequency by holding their portable radio receivers close to said tuning aid means and adjusting the tuning controls of their portable radio receivers to obtain maximum sound levels.

4,165,488

DERANGEMENT DETECTOR IN A RECEIVER OF A SYSTEM FOR DATA TRANSMISSION BY MEANS OF PHASE MODULATION OF A CARRIER

Loic B. Y. Guidoux, and Jean-Louis Renaudat, both of Le Plessis-Robinson, France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Sep. 20, 1977, Ser. No. 834,957

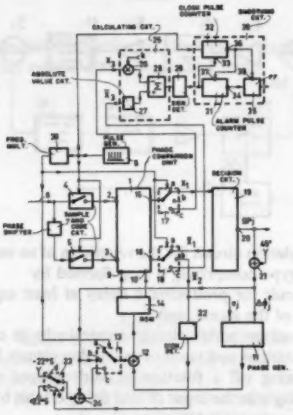
Claims priority, application France, Sep. 30, 1976, 76 29359

Int. Cl.[2] H04B *1/16*; H04L *27/24, 27/22*

U.S. Cl. 325—321 **4 Claims**

1. A derangement detector in a receiver of a system for data transmission by means of n-phase modulation of a carrier, the receiver comprising a phase discriminator including a calculating unit having input means for receiving digital signals having signal samples occurring at a rate equal to the data symbol rate, said digital signals being representative of the in-phase and

quadrature components of a received passband signal at each sampling instant and of the in-phase and quadrature components of a reference carrier at the preceding sampling instant, said calculating unit comprising means for calculating during a first interval of each period samples x_1 and $\overline{x_1}$ of signals representative of the in-phase and quadrature components of a signal derived from the passband signal by a phase rotation over an angle equal and opposite to the phase of the reference carrier at the preceding sampling instant, the phase discriminator reproducing the transmitted phase jumps from said signal samples x_1 and $\overline{x_1}$, said phase discriminator further comprising means for increasing during a second interval of each sampling period the phase of the reference carrier by a first additional phase equal to the phase variation of the transmitted carrier corresponding to the phase jump reproduced during said first interval, the derangement detector further comprising



(a) a circuit means coupled to said calculating unit for detecting the sign of one of the signal samples x_2 and $\overline{x_2}$ supplied by the calculating unit during said second interval,

(b) means coupled to said calculating unit for increasing during a third interval of each sampling period the phase of the reference carrier by said first additional phase and also by a second additional phase whose magnitude is equal to π/n and whose sign is opposite to the sign detected by said sign detection circuit,

(c) a calculating circuit means coupled to said calculating unit for producing a quantity $|\overline{x_3}| - kx_3$ from the signal samples x_3 and x_3 supplied by the calculating unit during said third interval, where k is a predetermined positive coefficient having a value smaller than tan (π/p), and

(d) a circuit means coupled to said calculating circuit for supplying alarm pulses at a negative sign of said quantity $|\overline{x_3}| - kx_3$.

4,165,489

CHANNEL CHANGE INDICATION CIRCUIT WITH DELAYED MEMORY ACTIVATION

Thomas J. Zato, Wheeling, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 3, 1978, Ser. No. 921,290
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—464 **4 Claims**

1. A limited-channel tuning system for a television receiver comprising;

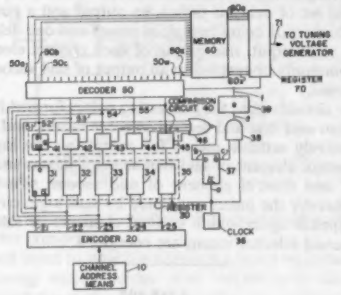
channel address means generating channel address information;

memory means having a plurality of locations each addressable by said channel address information and storing tuning information for different television channels, said memory means having a useful service life which is dependent upon cumulative activation time;

register means coupled to said channel address means for receiving therefrom and retaining desired channel address information;

pulse means coupled to said memory means for producing pulses for activation thereof;

comparator means having a first set of inputs coupled to said register means, a second set oi inputs coupled to said



memory means and an output, said comparator means producing an enabling signal at said output, whenever a change occurs in said channel address information;

delay means coupled between said output and said pulse means; and

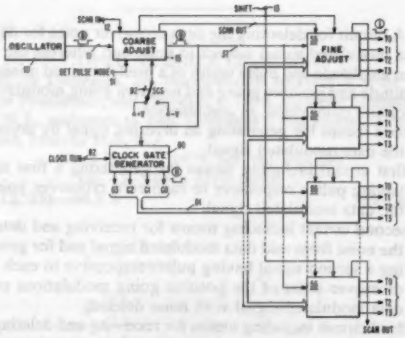
clock means periodically energizing said register means and said delay means, said delay means assuring that the memory location addressed corresponds to the new memory address information before permitting energization of said pulse means.

4,165,490

CLOCK PULSE GENERATOR WITH SELECTIVE PULSE DELAY AND PULSE WIDTH CONTROL

Leland D. Howe, Jr., Owego; Albert E. Paniccia, Binghamton, and Vincent A. Scotto, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,755
Int. Cl.[2] H03K 1/18
U.S. Cl. 328—60 **11 Claims**



1. Clock pulse generating apparatus for a computer system, including means for providing a series of repetitive clock pulses, the improvement comprising:

delay circuit means for providing a set of delayed pulses from each pulse of said series of repetitive pulses,

first selector means connected to said delay circuit means to receive said set of delayed pulses, and having a number of selectively operable control elements equal to the number

of delayed pulses in said set, each control element having an input connected to receive one delayed pulse of said set of delayed pulses, an output and a control input which upon being energized passes said one delayed pulse to said output, said output of each control element being commonly connected to an output of said first selector means,

second selector means connected to said delay circuit means to receive said set of delayed pulses, and having a number of selectively operable control elements equal to the number of delayed pulses in said set, each control element having an input connected to receive one delayed pulse of said set of delayed pulses, an output and a control input which upon being energized passes said one delayed pulse to said output, said output of each control element being commonly connected to an output of said second selector means,

logic circuit means for generating pulses formed from pulses from said first and second selector means, and

selectively settable means for energizing the input of one control element of said first selector means and the input of one control element of said second selector means, whereby the pulses generated by said logic circuit means depends upon which control elements of said first and second selector means are energized.

4,165,491

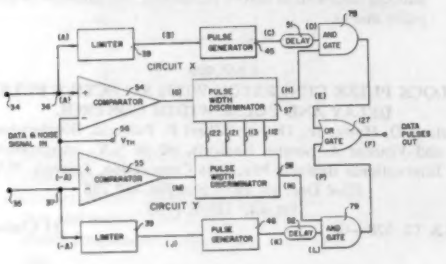
CIRCUIT FOR DETECTING ZERO CROSSING POINTS FOR DATA SIGNAL

Arthur P. Geffon, Sunnyvale, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 739,832, Nov. 8, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,654

Int. Cl.[2] H03K *5/153*

U.S. Cl. 328—150 **4 Claims**



1. A circuit for detecting the zero crossover point for data in a data modulated signal subject to noise and wherein the data has an amplitude and pulse width of a predetermined minimum magnitude and positive going and negative going modulations, said circuit comprising, in combination:

circuit means for generating an inverted signal by inverting the data modulated signal;

a first circuit including means for generating a first signal having pulses responsive to each zero crossover point of the data modulated signal;

a second circuit including means for receiving and deleting the noise from said data modulated signal and for generating a second signal having pulses responsive to each zero crossover point of the positive going modulations of the data modulated signal with noise deleted;

a third circuit including means for receiving and deleting the noise from said inverted signal and for generating a third signal having pulses responsive to all zero crossover points of the positive going modulations of the inverted signal with noise deleted; and

fourth circuit means for receiving said first, second and third signals and for generating an output signal having pulses responsive to the concurrent occurrence of pulses in the first signal and the second and third signals by comparing the pulses of the second and third signals in alternating sequence with the pulses of said first signal and transmitting pulses in the output signal only when there are concurrent pulses in the first and second signals alternately with the concurrent occurrence of pulses in the first and third signals.

4,165,492

RECIRCULATION CIRCUIT FOR REPETITION OF AN ANALOG PULSE SIGNAL

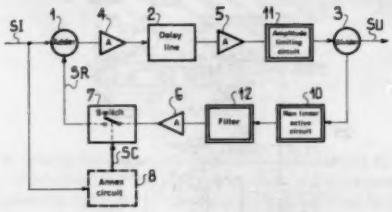
Marcel Motola, and Yves Besson, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 7, 1978, Ser. No. 884,213

Claims priority, application France, Mar. 11, 1977, 77 07332

Int. Cl.[2] H03B *1/04*; G11B *13/00*

U.S. Cl. 328—165 **4 Claims**



1. A recirculation circuit for the repetition of an analog pulse signal of the type comprising a loop formed by

a delay circuit for producing a delay at least equal to the duration of the signal, and

a divider and an adder circuit respectively in connection with the output and input of said delay circuit for respectively taking off a fraction of said delayed signal and re-inserting it in the input of said delay circuit by means of said adder circuit, and

amplifying means having linear characteristic inserted in said loop for producing a predetermined loop gain and switch means for closing said loop during a predetermined time corresponding to the envisaged number of repetition, said loop further comprising,

an active circuit having a nonlinear gain characteristics such that the gain is less than unity for signals of amplitude lower than a threshold value and higher than unity for signals of amplitude higher than said threshold value, said nonlinear active circuit having a linear response curve in amplitude within the range of the useful signals, that is to say outside that defined by said threshold value, the latter being determined in relation with the amplitude of the useful signal to be repeated and of the signal to noise ratio presented by said input signal so as to substantially attenuate the parasitic noise signals, and

an amplitude limiting circuit for repeating said signal with a constant amplitude.

4,165,493

PROTECTED AMPLIFIER APPARATUS

Timothy A. Harrington, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 17, 1978, Ser. No. 896,650

Int. Cl.[2] H03G *3/20*

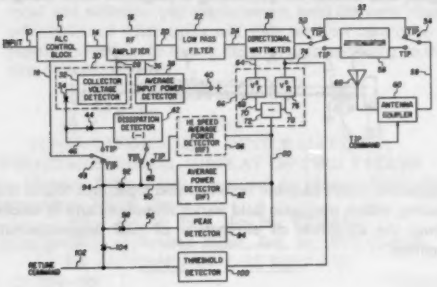
U.S. Cl. 330—207 P **7 Claims**

1. Amplifier apparatus for coupling to an antenna load comprising, in combination:

RF amplifier means including RF signal input means, gain control means and RF signal output means;

average power detection means, connected between said RF signal output means and said gain control means of said RF amplifier means, for controlling the level of said RF amplifier means during tuning in accordance with the

difference between the average power delivered to a load and the average DC input power supplied to the amplifier



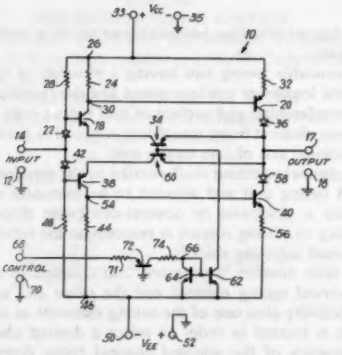
to maintain dissipation in the output stage of said RF amplifier means within prescribed limits.

4,165,494

BI-STATE LINEAR AMPLIFIER

Barry E. Becker, Smithtown, N.Y., assignor to Circuit Technology Incorporated, Farmingdale, N.Y.

Filed Apr. 28, 1978, Ser. No. 900,967
Int. Cl.[2] H03F 3/18
U.S. Cl. 330—267 **6 Claims**



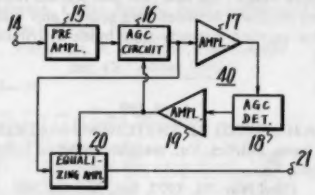
1. A bi-state amplifier comprising an input; an output; amplifier circuit means connected between said input and output for substantially linear amplification and including at least one amplifier circuit path; means for selectively applying a control signal having at least first and second states; and control circuit means coupled to receive said control signal from said control signal means and coupled to said amplifier circuit means for maintaining closed said at least one amplifier circuit path when said control signal is in a first state and for opening said at least one amplifier circuit path when said control signal is in a second state, said amplifier circuit means being adapted to present a high output impedance when said at least one amplifier circuit path is opened and a low output impedance when said at least one amplifier circuit path is closed.

4,165,495

CIRCUIT SYSTEM FOR REPRODUCING A SIGNAL FROM A MOVING RECORD CARRIER

Hiroo Takahashi, Chigasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 920,676
Claims priority, application Japan, Jul. 20, 1977, 52-86999
Int. Cl.[2] H03G 9/26; G11B 7/00
U.S. Cl. 330—283 **8 Claims**



1. A circuit system for reproducing a signal from a moving record carrier comprising:

(a) a circuit input to which is supplied a signal read out from the moving record carrier with variations in the level introduced due to the shift of a reading out position on the carrier;

(b) an automatic gain control circuit loop connected to said input, said circuit loop including a gain control circuit supplied with said read out signal and a gain control signal generating circuit connected to an output of said gain control circuit for producing a gain control signal varying in response to the level of said read out signal supplied to said gain control circuit and supplying said gain control signal to said gain control circuit for automatically controlling the gain thereof;

(c) a variable gain amplifier circuit having a variable gain-frequency characteristic varying in correspondence with the frequency of a signal applied thereto to be amplified, said variable gain amplifier circuit being connected to the output of said gain control circuit and being supplied with said gain control signal produced in said automatic gain control circuit loop to be controlled in its variable gain-frequency characteristic in response to said gain control signal; and

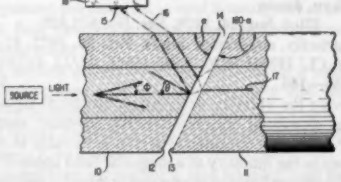
(d) a circuit system output connected to the output of said variable gain amplifier circuit to derive thereat the read out signal compensated for said variations in the level.

4,165,496

OPTICAL FIBER LIGHT TAP

Mauro Di Domenico, Jr., Bernardsville; Michael A. Karr, III, New Providence, and Theodore C. Rich, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1977, Ser. No. 861,288
Int. Cl.[2] H01S 3/13; G02B 5/14
U.S. Cl. 331—94.5 S **10 Claims**



1. A light tap for use in an optical communications system including a source of an optical signal and a first optical fiber to transmit said signal, said light tap comprising:

(a) a segment of said first optical fiber having a first planar endface intersecting the longitudinal axis of said first fiber at an angle of α;

(b) a second optical fiber in substantially coaxial alignment with said segment and having a second planar endface intersecting the longitudinal axis of said second fiber at an angle of (180 degrees $-\alpha$), said first and second endfaces being adjacent to each other and forming a gap therebetween;

(c) a dielectric film filling said gap which has a different refractive index than said first and second fibers; and

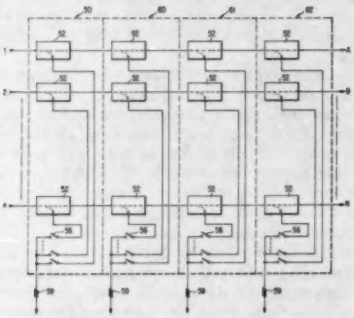
(d) means disposed between said source and said first endface for exciting a steady-state mode distribution of said signal.

4,165,497

WIDEBAND RF SWITCHING MATRIX

Ronald E. Irons, Fairfax, Va., assignor to Aiken Industries Inc., Alexandria, Va.

Filed Nov. 11, 1977, Ser. No. 850,500
Int. Cl.[2] H01P *1/10*
U.S. Cl. 333—101 **5 Claims**



1. A wideband RF switching matrix comprising:

a plurality of input conductors;

an output conductor;

an equal plurality of lumped element directional couplers associated respectively with the plurality of input conductors, each lumped element directional coupler having an input port connected to a respective input conductor for receiving signal power applied to the input conductor, and a coupled output port for tapping off part of the signal power; and

an equal plurality of switching means connected to respective coupled output ports of the plurality of lumped element directional couplers for providing selectively closable signal paths from the coupled output ports to the output conductor.

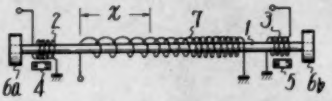
4,165,498

VARIABLE DELAY DEVICE

Masayuki Hongu, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 24, 1978, Ser. No. 871,850
Claims priority, application Japan, Feb. 10, 1977, 52/13988
Int. Cl.[2] H03H *9/30, 9/00*; H01L *41/12, 41/20*
U.S. Cl. 333—144 **6 Claims**

1. A device for variably delaying an electrical signal, comprising: an elongated magnetostrictive member made of a material the Young's modulus of which is variable in response to variations in the intensity of a magnetic field applied thereto; an input transducer located at one end portion of said magnetostrictive member for converting the electrical signal to be delayed into a supersonic wave within said magnetostrictive member; an output transducer located at the other end portion of said magnetostrictive member for converting supersonic waves within said magnetostrictive member into an electrical signal; and means for producing a magnetic field along said



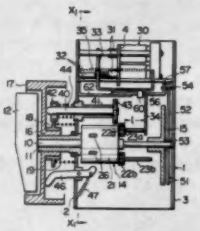
magnetostrictive member between said input and output transducers, which magnetic field varies monotonically in intensity along the direction of elongation of said magnetostrictive member.

4,165,499

CHANNEL-SELECTING, PRESETTABLE, ROTARY TYPE TUNING DEVICE

Tamaki Ohashi, and Susumu Sato, both of Tokyo, Japan, assignors to Nihon Technical Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1977, Ser. No. 823,165
Claims priority, application Japan, Aug. 13, 1976, 51-97286; Aug. 27, 1976, 51-102421; Nov. 25, 1976, 51-158044[U]
Int. Cl.[2] H03J *5/10*
U.S. Cl. 334—47 **10 Claims**



1. A channel-selecting, presettable rotary type tuning device comprising:

(a) a rotatable tuning unit having a plurality of tuning elements located at predetermined angular spacings along a circumferential end surface of said tuning unit; each said tuning element being movable in a direction parallel to the rotational axis of said tuning unit;

(b) a channel selecting shaft parallel to the rotational axis of said tuning unit and adapted to be manually rotated in either a clockwise or counter-clockwise direction, the tuning unit being rotated in response to the rotation of the channel selecting shaft;

(c) a slide member having one end coupled to a variable electrical tuning element and the other end adapted to selectively abut one of the tuning elements as said tuning unit is rotated in order to select a desired channel, the frequency of the selected channel being determined in accordance with the position of the tuning element abutting said slide member;

(d) a tuning shaft having an operating knob and arranged in parallel relationship with said channel selecting shaft and adapted to be rotated when said knob is depressed, the depression of said knob causing the tuning shaft to slide axially and cause a first transmission member to operably engage a second transmission member associated with each said tuning element whereby rotation of said tuning shaft varies the position of the tuning element abutting said slide member to preset a desired channel frequency;

(e) cam means adapted to rotate when said channel selecting shaft and said tuning unit are rotated; and

(f) lever means cooperatively associated with said cam means and said slide member whereby the rotation of said

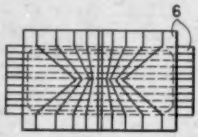
cam means causes the lever means to displace the slide member from its abutment with a preselected tuning element and maintain said displacement until the next channel is selected whereupon said slide member returns to a position abutting the tuning element corresponding to the next selected channel.

4,165,500

TUNING INDICATING DEVICE HAVING A TWO-DIMENSIONAL DISPLAY OF TWO VALUES

Akira Misawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 19, 1978, Ser. No. 870,964
Claims priority, application Japan, Jan. 24, 1977, 52-6626
Int. Cl.[2] H03J *1/04, 1/02;* H01J *1/62*
U.S. Cl. 334—86 **7 Claims**



1. A tuning indicating device in a radio tuner employing a first signal representing the strength of a selectively received signal and a second signal representing deviation of the frequency of said received signal from a predetermined central frequency, comprising:

a display unit for displaying a two-dimensional pattern wherein each of the dimensions changes in response to a different drive signal; and

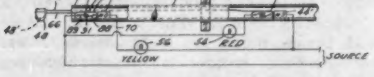
drive means for converting said first and second signals into said drive signals.

4,165,501

POSITION SENSING SYSTEM

Edgar A. Bongort, Southfield, and William T. Cruickshank, Pontiac, both of Mich., assignors to B/W Controls Inc., Birmingham, Mich.

Filed Oct. 25, 1977, Ser. No. 845,294
The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.
Int. Cl.[2] H01H *36/00*
U.S. Cl. 335—206. **14 Claims**



1. In a position sensing system the combination comprising:

a carrier whose position is to be sensed,

means supporting the carrier for movement along a predetermined path,

a reed switch disposed adjacent said predetermined path and having reeds extending substantially parallel thereto,

means for establishing a magnetic bias field across the reeds with its field strength sufficient to hold the reeds closed but insufficient to close them, and

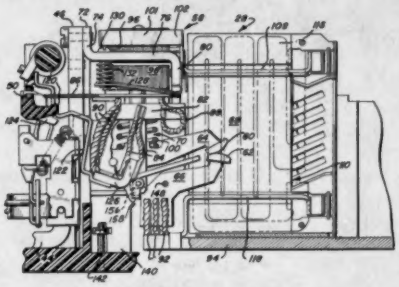
magnet means movable with the carrier adjacent said predetermined path for magnetically influencing said reed switch, said magnet means establishing a magnetic field having leading and trailing field portions of opposite direction for sweeping the switch reeds and one field portion augmenting the bias field to close the reeds as the magnet means passes the switch moving in one direction and the other field portion opposing the bias field opening the switch reeds as the magnet means passes the switch moving in the opposite direction at substantially the same point where the reeds were closed.

4,165,502

CURRENT LIMITER ASSEMBLY FOR A CIRCUIT BREAKER

Paul R. Andersen, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

Filed Jun. 8, 1977, Ser. No. 804,693
Int. Cl.[2] A01H *75/10*
U.S. Cl. 335—39 **19 Claims**



1. A current limiting assembly for a circuit breaker having a pair of serially connected main circuit breaker contacts operable to an open position in response to the movement of a trip bar in response to either an overheat or overcurrent condition, the improvement comprising:

a pair of current limiting contacts,

an electromagnet assembly including a low resistance winding connected to said main contacts and operable in response to a high fault current for opening said current limiting contacts, and

a bimetal serially connected between said winding and one of said current limiting contacts for responding to an overheat condition to move said trip bar for opening said main contacts.

4,165,503

HYDROSTATIC SEISMIC SENSOR

Allen B. Holmes, Rockville, and Stacy E. Gehman, Takoma Park, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 9, 1977, Ser. No. 858,983
Int. Cl.[2] G01V *1/16*
U.S. Cl. 340—17 R **5 Claims**

1. A hydrostatic seismic accelerometer comprising:

a housing including a first interior chamber;

a sensing mass in said first chamber, said sensing mass having first and second coaxial cavities;

an alignment pin attached to said housing and extending into said first cavity for maintaining the alignment of said sensing mass;

a first flexible closed reservoir, containing a sensing fluid, extending into said first chamber and into said second cavity to support said sensing mass;

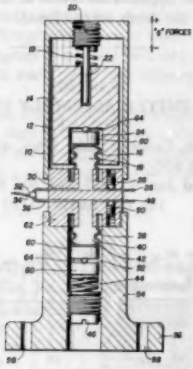
a first spring encircling said alignment pin and biasing said sensing mass against said first reservoir;

a mounting base connected to said housing, said base having a second interior chamber;

a second flexible closed reservoir, containing a sensing fluid, extending into said second chamber;

a second spring biased against said second reservoir;

a differential pressure transducer having one side connected to said first reservoir and the other side connected to said



second reservoir; and valve means for venting said second reservoir to the atmosphere.

4,165,504

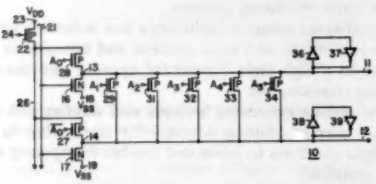
CMOS DECODER

James J. Remedi, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1978, Ser. No. 895,849

Int. Cl.[2] H04Q *3/00*

U.S. Cl. 340—167 R **10 Claims**



1. A digital data decoder having a plurality of circuits comprising: a first and a second output; first means coupled to the first output to controllably precharge the first output; second means coupled to the second output to controllably precharge the second output; a first transistor having a first and a second current carrying electrode and having a control electrode, the first electrode being coupled to a first supply voltage, the control electrode being coupled to a timing signal to enable the first transistor at a predetermined time; a second and third transistor each having first and second electrodes and each having a control electrode, the first electrode of the second and third transistors being coupled to the second electrode of the first transistor, the second electrode of the second transistor being coupled to the first output, the second electrode of the third transistor being coupled to the second output, the control electrode of the second transistor being coupled to a least significant bit of a coded digital signal, the control electrode of the third transistor being coupled to the complement of the signal coupled to the control electrode of the second transistor; a first and a second pair of back-to-back inverters, the first pair of inverters being coupled to the first output and the second pair of inverters being coupled to the second output, the back-to-back inverters being capable of maintaining the outputs in a static state; and a plurality of transistors coupled between the first and second output, each of the plurality of transistors having a control electrode coupled to a different bit of the coded digital signal.

4,165,505

APPARATUS FOR REMOTELY DETERMINING THE ANGULAR ORIENTATION, SPEED, AND/OR DIRECTION OF ROTATION OF OBJECTS

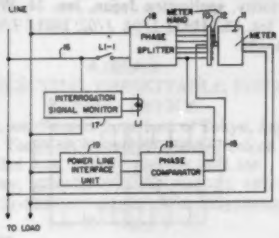
Charles J. Cain, P.O. Box 991, Greenville, N.C. 27834, and Arthur T. Shankle, 5111 Falls of Neuse Rd., Raleigh, N.C. 27609

Division of Ser. No. 612,684, Sep. 12, 1975, Pat. No. 4,007,454. This application Jan. 3, 1977, Ser. No. 756,117

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.[2] G08C *19/10*

U.S. Cl. 340—200 **5 Claims**



1. A method for remotely monitoring the angular position of a meter hand as it rotates about an axis of rotation and defines a circular path, which meter hand has a dielectric constant different than that of the surrounding medium, comprising the steps of:

(a) generating a rotating electric field which defines a path parallel to the plane defined by the path of the rotating meter hand and which field includes therein, at least a portion of the meter hand, wherein the step of generating said rotating electric field comprises:

(i) arranging a plurality of electrodes on a stationary body in a planar circular array around the center point aligned to said axis of rotation of said meter hand;

(ii) locating a reading electrode on said body at said center point whereby a rotating electric field extending between said plurality of said electrodes and said reading electrode will be generated; and

(iii) connecting successive electrodes in said array to successive phases of polyphase voltage;

(b) detecting voltage changes induced at said reading electrode caused by said electric field intersection of said meter hand.

4,165,506

CONTROL UNIT FOR THE BRIGHTNESS OF VIDEO SIGNALS ON A RASTER SCAN DISPLAY

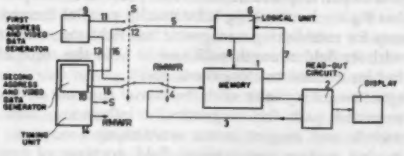
Antoon H. Brands, Borne, and Jouke Gietema, Hengelo (O), both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo (O), Netherlands

Filed Jun. 8, 1977, Ser. No. 804,720

Claims priority, application Netherlands, Jun. 26, 1976, 7606745

Int. Cl.[2] G06K *15/20*

U.S. Cl. 340—706 **10 Claims**



1. A control unit for a raster scan display comprising:

a random access memory comprising a plurality of elements

each containing only the brightness data associated with a video signal to be displayed at a predetermined position on the raster scan display corresponding to the memory address of said element;

a readout circuit connected to said memory which functions to provide a memory address to said memory and to read out said data at the corresponding one of said memory elements and present a corresponding video signal on the raster scan display;

switching means connected to said memory which function to alternately supply the memory with an address pertaining to data in one of said memory elements to be modified, and with an address provided by the readout circuit pertaining to data in one of said memory elements required to be read out of said memory; and

a logical unit connected to said switching means and said memory which functions to independently overwrite the data in ones of said elements of said memory.

4,165,507

NON-LINEAR DIGITAL TO ANALOG CONVERSION BY INTERMEDIATE CONVERSION TO TIME INTERVAL

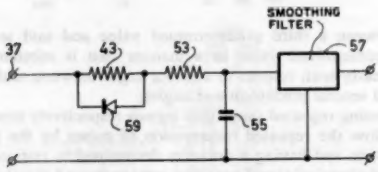
Kian K. Ong, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,674

Claims priority, application Netherlands, Oct. 9, 1975, 7511840

Int. Cl.² H03K *13/20*

U.S. Cl. 340—347 DA **6 Claims**



1. An improved digital-to-analog converter in which a digital signal is converted into a periodical pulse signal and than filtered to yield a direct current, said converter including an input means which converts a digital signal to a periodical pulse signal, a filter circuit including a filter for converting a pulse signal to direct current which serves as an input to an oscillator, wherein the improvement comprises:

an electrical network which receives as input a periodical pulse signal and outputs a signal to said filter having for said pulse signal a charge time constant differing from its discharge time constant such that a non-linear relation is obtained between the value of the input signal to said network and the amplitude of the output signal of said filter circuit;

said network serving as the input circuit to said filter, comprising:

an input means to receive said periodical pulse signals;

a first resistive means connected to said input means;

a diode connected in parallel with said first resistive means;

second resistive means connected in series to the output of said first resistive means and said diode;

capacitive means connected in series to the output of said second resistive means and the input to said filter; said diode serving to shunt at least partially said resistive means;

the output of said capacitive means being the output of said network and serving as input to said filter;

said filter having an input means connected in series with the output of said network, said filter serving to smooth the signal applied to its input.

4,165,508

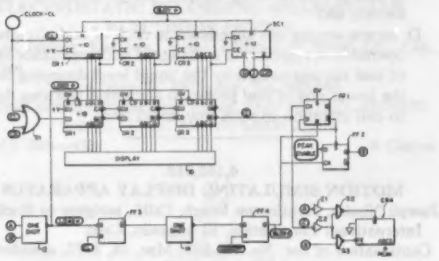
METHOD AND APPARATUS FOR DETECTING A PEAK VALUE OF AN ANALOG SIGNAL

LeRoy D. Barter, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 28, 1978, Ser. No. 882,286

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 AD **4 Claims**



1. In combination with apparatus for measuring an analog signal of the type which includes converter means for sampling said analog signal at successive times having counting means for counting pulses from a source of digital pulses during time intervals following each sampling time to provide a digital pulse count of the amplitude value for each sample of said analog signal and for generating a first timing signal upon the completion of each digital pulse count, said counting means being adapted to continue to count beyond the value of said digital pulse count, apparatus for detecting peak values of said analog signal comprising:

register means for (1) storing a prior digital pulse count corresponding to an amplitude value of said analog signal at a prior sampling time, (2) recounting said prior count, and (3) generating a second timing signal when said recount is completed;

means responsive to a current sampling of said analog signal for enabling said register means to recount said prior digital pulse count simultaneous with said counting means counting toward the current digital pulse count for the current sample of said analog signal; and

means responsive to the later occurring of said first and second timing signals for storing the digital pulse count then attained by said counting means in said register means, whereby the digital pulse count stored in said register means is always the greater of said prior digital pulse count and said current digital pulse count.

4,165,509

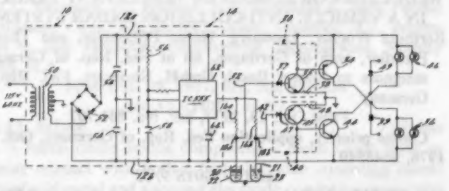
DUAL LIQUID LEVEL MONITOR

Donald J. Betts, St. Charles, and Martin W. Hamilton, Arlington Heights, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 24, 1977, Ser. No. 827,297

Int. Cl.² G08B *21/00*

U.S. Cl. 340—620 **9 Claims**



1. A device for sensing the liquid level in a plurality of

reservoirs each normally containing a quantity of a liquid to be dispensed, said device comprising:

A. an electrical sensing probe suspended within each of said reservoirs;

B. means defining an electrical circuit passing through each of said probes and through the liquid in the respective said reservoir to ground;

C. means for applying a common alternating current to each of said probes to set up an alternating current flow in said circuit; and

D. means sensing the impedance in each of said circuits and operative in response to a change in said impedance in any of said circuits caused by the liquid level dropping below the lower end of said probe, to activate a warning device to call attention to such low liquid level.

4,165,510

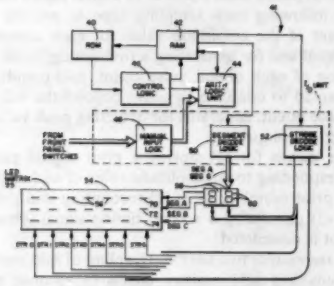
MOTION SIMULATING DISPLAY APPARATUS

Joseph Nissim, Huntington Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 781,807, Mar. 28, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,036

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—754 **13 Claims**



1. A display device for emulating the appearance of objects in substantially continuous motion and comprising:

a plurality of light-emitting diodes of substantially equal light emission characteristics and mounted in a matrix array configuration on a high dielectric material, the shape and size of the emitting area of each diode and the spacing between said diodes being such as to create the appearance of substantially continuous motion of lighted objects when said diodes are selectively enabled and disabled to respectively commence and cease the emission of light in an ordered sequence; and

means programmed for cyclically applying a light emission enabling current through each such diode to the exclusion of other diodes in said plurality for a predetermined duration and in a predetermined sequence.

4,165,511

REDUCTION OF ECHOES OF IRRELEVANT TARGETS IN A VEHICLE ANTI-COLLISION RADAR SYSTEM

Berthold Wocher, Leonberg; Heinz Pfitzmaier, and Thomas Pfendler, both of Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,707

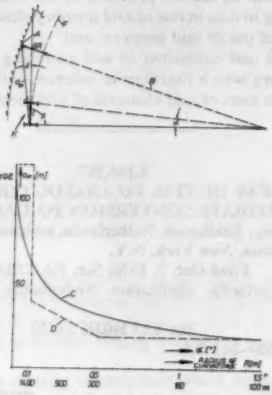
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646540

Int. Cl.[2] G01S *9/02*

U.S. Cl. 343—7 VM **5 Claims**

1. A method of avoiding or reducing response of a vehicle-mounted anti-collision radar system to irrelevant targets when the vehicle in which the radar system is mounted is proceeding in a curved path, comprising the steps of:

producing an electrical signal corresponding to the steering angle defined by the rotary deviation, in either direction, of a steering control of the vehicle from the position of such control for a straight path, which signal has a first predetermined signal value when the steering angle is less than a predetermined angle just large enough to exceed steering correction angles normally necessary in driving on a straight path and has a second predetermined signal value when the steering angle exceeds a second predetermined angle, and, further, has a signal value that varies,



between a third predetermined value and said second predetermined value in a manner that is substantially linearly with respect to steering angle between said first and second predetermined angles;

producing repeated range gate signals respectively timed to follow the repeated transmission of pulses by the radar system and having a duration determined in response to said electrical signal, said first predetermined signal value being a value chosen so as to give or allow said range gate signal a maximum duration, and

applying the range gate signal to the echo evaluation circuits of said radar system so as to suppress the effect of echoes received after the termination of said range gate signal.

4,165,512

RECORDING APPARATUS

Dean M. Peterson, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 833,309, Sep. 13, 1977, abandoned. This application Mar. 29, 1978, Ser. No. 891,077

Int. Cl.[2] G01D *9/00, 9/42;* H05B *3/34*

U.S. Cl. 346—24 **18 Claims**

1. A recording apparatus for a recording medium having a light sensitive, heat developed emulsion on a front surface thereof and an electrically conductive back surface, said apparatus comprising:

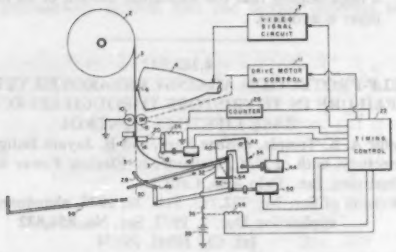
means for exposing said emulsion surface to a selected light pattern to produce a latent image thereon,

drive means for drawing said medium past said means for exposing, said drive means being positioned in close proximity to said means for exposing, a second member comprising an electrically conductive element positioned to engage said conductive surface of said recording medium,

clamping means for periodically clamping said recording medium at a position a predetermined distance from said drive means, said clamping means including at least one jaw member of electrically conductive material positioned to engage said conductive surface of said medium, and

means to selectively pass an electrical current through said

conductive surface between said clamping means and said conductive member to cause said conductive surface of



said medium to produce heat whereby to effect the development of said latent image.

4,165,513

SIGNAL-OPERATED MARKING DEVICE

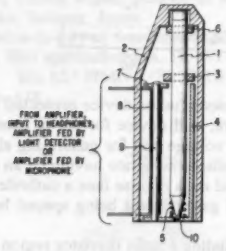
Harold E. Flory, Seasharp Limited, Richborough Hall, Ramsgate Rd., Kent Ct. 9 NP, England

Filed Jul. 15, 1977, Ser. No. 816,272

Claims priority, application United Kingdom, Oct. 7, 1976, 41730/76

Int. Cl.[2] G01D *15/16*

U.S. Cl. 346—141 **1 Claim**



1. An electrically actuated, hand-holdable marking apparatus comprising a marker member, an electromagnetic device which when energized by electrical pulses causes the marker member to bear on a surface to be marked with sufficient pressure that said marker member marks the surface, a casing which can be held in a user's hand and encloses said marker member and said electromagnetic device, said casing having a slider portion for sliding across the surface to be marked and an aperture in said slider portion through which an end of said marker member can pass, a cage containing a plurality of balls and having a conical inner surface which slopes away from the marking end of said marker member, said cage being of magnetizable material and being positioned about said marker member, said balls and said conical surface co-operating when said cage moves towards said electromagnetic device when it is energized to cause said balls to move inwardly and grip said marker member, and spring means in said casing adjacent to said cage, said cage being urged by said spring means in a direction opposite to the direction of movement of said cage toward said electromagnetic device, said casing of the apparatus being such that in use it is held in the user's hand and is moved across the surface to be marked with said slider portion of said casing in contact with the surface to be marked, and said slider portion comprising a flat surface portion of said casing which is of a sufficient area that it will support the apparatus in an upright position on a substantially horizontal surface to be marked, whereby when the electromagnetic device is energized it causes said marker member to move with respect to the surface to be marked and mark the surface with marks that are of a length dependent upon the duration of the electrical pulses and velocity at which the user moves the apparatus across the surface to be marked.

4,165,514

ELECTROSTATIC RECORDING MULTI-STYLUS ELECTRODE DEVICE

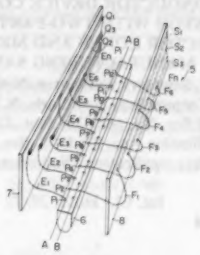
Kazumi Ishima, Kashiwa, Japan, assignor to Ricoh Co., Ltd., Japan

Filed May 11, 1978, Ser. No. 905,045

Claims priority, application Japan, May 16, 1977, 52-56152

Int. Cl.[2] G03G *15/044*; G01D *15/06*

U.S. Cl. 346—155 **4 Claims**



1. In an electrostatic recording multi-stylus electrode device for use with a facsimile apparatus or the like, the improvement comprising:

a plurality of stylus electrodes (P) embedded in at least one row (A—A) in an electrode support member (6),

a plurality of spaced insulating base plates (7,8) supporting a plurality of connecting wires (Q) for selectively applying voltage to said electrodes, said connecting wires (Q) being spaced apart from each other to reduce electrostatic capacity therebetween,

lead wires (E,F) for connecting each of said stylus electrodes (P) to selected ones of said connecting wires (Q), said lead wires (E,F) being spaced from each other so as to reduce electrostatic capacity therebetween,

the spacing of said connecting wires (Q) and said lead wires (E,F) being selected to minimize a floating electrostatic capacity (C) therebetween,

each stylus electrode (P) in said row (A—A) being connected to one of said connecting wires (Q) on one of said insulating base plates (7) with an adjacent stylus electrode (P) in said row (A—A) being connected to one of said connecting wires (Q) on another of said base plates (8).

4,165,515

LIGHT EMITTING TUNNEL JUNCTIONS WHICH ARE STABLE AT ROOM TEMPERATURE

John G. Bergman, Jr., Rumson, N.J.; Ravinder K. Jain, Pacific Palisades, Calif., and Sigurd Wagner, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

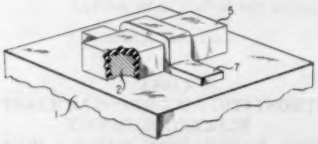
Filed Dec. 28, 1977, Ser. No. 865,238

Int. Cl.[2] H01L *49/02*

U.S. Cl. 357—6 **7 Claims**

1. A metal oxide device comprising a metal oxide layer in intimate contact with both a first electrode consisting essentially of said metal and a second electrode consisting essentially of silver, CHARACTERIZED IN THAT said metal is chosen from the group consisting of beryllium and magnesium, whereby when a voltage is applied across said first and second

electrode at room temperature a continuous visible light emission is obtainable whereby when a voltage is applied across



said first and second electrode at room temperature a continuous visible light emission is obtainable.

4,165,516

SEMICONDUCTOR DEVICE COMPRISING TRANSISTOR WITH TWO-PART BASE AND COLLECTOR ZONES AND METHOD OF MANUFACTURING SAME

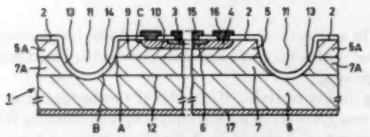
Walter H. M. M. Smulders, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 668,826, Mar. 22, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,816

Claims priority, application Netherlands, Apr. 28, 1975, 7504990

Int. Cl.[2] H01L *29/72*

U.S. Cl. 357—34 **19 Claims**



1. A semiconductor device comprising:

(a) a semiconductor body having a substantially flat surface and comprising at least a transistor,

(b) said transistor having,

(i) an emitter zone of first conductivity type adjoining said flat surface,

(ii) a base zone of second conductivity type which adjoins said flat surface and surrounds said emitter zone entirely, said emitter and base zones forming a first p,n junction which terminates at said flat surface, and

(iii) a collector zone of said first conductivity type which adjoins said base zone, said collector zone forming with said base zone a second p,n junction which extends substantially parallel to said surface, said base zone comprising both a more highly doped first part which entirely surrounds and completely contacts the emitter zone to form therewith said first p,n junction, and a lower and substantially homogenously doped second part which adjoins said collector zone and forms therewith said second p,n junction, said two parts of said base zone mutually forming a certain junction terminating at said flat surface,

(c) a groove provided in said flat surface, which groove surrounds said base zone entirely and intersects said second p,n junction, said flat surface extending at both sides of said groove,

(d) said collector zone comprising a substantially homogenous, lower-doped first part which forms said second p,n junction with said second part of said base zone and a more highly-doped second part which forms another junction with said first part of said collector zone, said other junction extending substantially parallel to said surface, said groove being provided at a distance from said first part of said base zone and being coated with an electrically insulating material which is substantially free of negative electric charges, which groove intersects only said second, lower-doped part of said base zone and extends down into said second, more highly doped part of said collector zone, the bottom of said groove having such a high doping that the formation therein of an inversion layer is avoided.

4,165,517

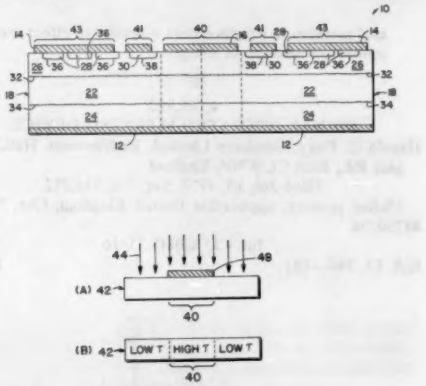
SELF-PROTECTION AGAINST BREAKOVER TURN-ON FAILURE IN THYRISTORS THROUGH SELECTIVE BASE LIFETIME CONTROL

Victor A. K. Temple, Clifton Park, and B. Jayant Baliga, Schenectady, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 772,712, Feb. 28, 1977, abandoned. This application Dec. 2, 1977, Ser. No. 856,832

Int. Cl.[2] H01L *29/74*

U.S. Cl. 357—38 **7 Claims**



1. A thyristor semiconductor device protected against voltage breakover failure, said device for use in connection with means for applying voltage and for generating electrical currents, comprising a silicon substrate having on an obverse face an anode contact and on a reverse face a cathode contact and a gate contact, said gate contact being spaced laterally from said anode contact,

said substrate including a main thyristor region between the anode contact and the cathode contact, a gate subtransistor region between the anode contact and the gate contact and a gate emitter region substrate between the gate contact and the cathode contact establishing a pilot thyristor region, said pilot thyristor region being operatively coupled to said main thyristor region to turn on said main thyristor region when said pilot thyristor region is turned on, said gate subtransistor region being characterized by a locally longer minority carrier lifetime than the minority carrier lifetime in any area of the main thyristor region, such that excessive forward voltage causes currents initially to flow only in the gate subtransistor region and act to turn on said pilot thyristor region.

4,165,518

VIDEO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

Jun Hirai, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 18, 1977, Ser. No. 770,315

Claims priority, application Japan, Mar. 1, 1976, 51-21997

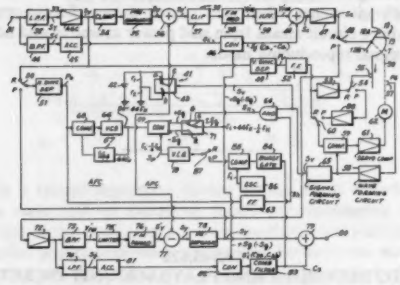
Int. Cl.[2] H04N *5/76*; G11B *5/04*; H04L *7/00*

U.S. Cl. 358—8 **68 Claims**

1. Apparatus for recording video signals in successive parallel tracks on a record medium, comprising

modulating means for frequency modulating at least the luminance portion of said video signals on a carrier;

means for shifting the carrier frequency of the frequency modulated portion of the video signals between different first and second carrier frequencies which are in frequency interleaving relation to each other, said shifting means including a bias voltage generating means operative to alternatively provide first and second different bias



voltages by which said first and second carrier frequencies are respectively established; and

means for controlling said shifting of the carrier frequency so as to record said frequency modulated portion of the video signals with said first and second carrier frequencies, respectively, in tracks which are next adjacent each other.

4,165,519

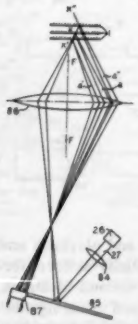
OPTICAL CONTROL SYSTEM FOR READ OUT FROM INFORMATION RECORDING MEDIUM

Kenjiro Goto, Urawa, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Saitama, Japan

Continuation-in-part of Ser. No. 492,531, Jul. 29, 1974, abandoned. This application Jan. 11, 1977, Ser. No. 758,464

Int. Cl.[2] H04N *5/76*; G11B *7/12*

U.S. Cl. 358—128 **8 Claims**



1. An optical control system for information read out of video and/or audio information optically recorded in a track on the surface of a discshaped information medium comprising:

light beam generating means for projecting a unitary light beam onto a single track on the information medium to read information,

means for focusing said unitary beam into a spot of predetermined transverse dimension at the locus of impingement thereof with the plane of said track and including an objective lens through which incident and reflected beams pass wherein the axes of said incident and reflected light beams deviate from the optical axis of said objective lens,

means for selectively deflecting said unitary light beam transversely of the longitudinal axis of said track,

photo-sensitive receptor means responsive to impingement of said reflected light beam after passing through said objective lens and adapted to provide at least a first output signal component selectively indicative of the nature and magnitude of transversely directed departures of said spot from a predetermined desired positional relationship thereof relative to a predetermined edge of said track and a second output signal component selectively indicative of the nature and magnitude of departures of said spot from said predetermined transverse dimension thereof at the locus of impingement thereof with said plane of said track induced by variation in spacing between said track and said objective lens,

means responsive to said first signal component for selectively actuating said light beam deflecting means to return said spot into predetermined positional relation relative to the predetermined edge of said track, and

means responsive to said second signal component for selectively actuating said focusing means to refocus said light beam into said spot of predetermined transverse dimension in impinging relation with the plane of said track.

4,165,520

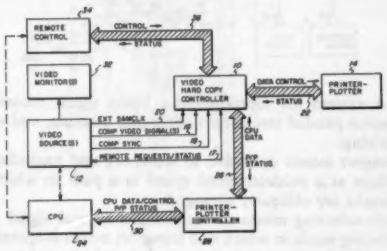
VIDEO HARD COPY CONTROLLER

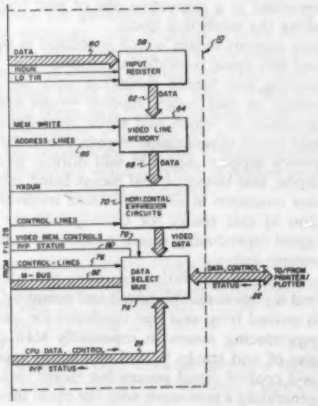
Louis E. Wessler, Cupertino; Kenneth F. Koch, Mountain View, and Andrew J. Cleveland, Saratoga, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1977, Ser. No. 842,992

Int. Cl.[2] H04N *1/40*

U.S. Cl. 358—280 **27 Claims**





1. A video hard copy controller comprising:

first means for receiving serial input video signals from a first source;

second means coupled to said first means for converting said serial input video signals into a first set of parallel digital signals; and

third means coupled to said second means for receiving said

first set of parallel digital signals, said third means including means for receiving a second set of parallel digital signals from a second source and means responsive to a control signal for selecting between said first and second sets of parallel digital signals for output to a hard copy generating device in order to produce a hard copy fascimile of the images represented by the selected set of parallel digital signals.

4,165,521

VIDEO SIGNAL REPRODUCING SYSTEM WITH MOVEABLE HEAD FOR SLOW OR STOP TRACKING CONTROL

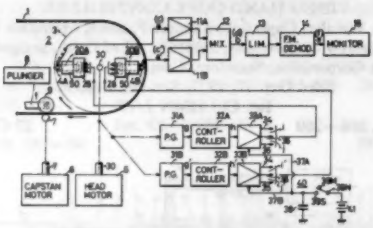
Yoshimi Watanabe, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 731,763, Oct. 12, 1976. This application Jun. 2, 1978, Ser. No. 911,832

Claims priority, application Japan, Oct. 14, 1975, 50-123638

Int. Cl.[2] H04N *5/78*; G11B *21/04, 21/10*

U.S. Cl. 360—10 **6 Claims**



1. A system for reproducing a video signal recorded in successive parallel tracks on a recording medium, said system comprising:

transport means operative to transport said recording medium at a predetermined speed in a path to which said tracks are obliquely arranged;

mode-selecting means for selecting a normal signal reproducing mode in which said transport means is operative or a still signal reproducing mode in which said transport means is inoperative;

signal reproducing means for reproducing a video signal recorded in a respective one of said tracks by scanning along the respective track;

rotary support means which is rotated in both said normal and still signal reproducing modes;

bi-morph leaf means mounting said signal reproducing means on said rotary support means and having a rest condition in which said signal reproducing means scans said tracks in succession in response to the rotation of said rotary support means in said normal signal reproducing mode, said bi-morph leaf means being movable from said rest condition in either direction transverse to the direction of said tracks for correspondingly displacing said signal reproducing means relative to said rotary support means; and

control signal generating means to provide still mode control signals to said bi-morph leaf means by which the latter is moved from said rest condition for causing said signal reproducing means to repeatedly scan along a selected one of said tracks in said still signal reproducing mode, said control signal generating means including means for generating a saw-wave with the cycle thereof corresponding to the interval for scanning of one of said tracks by said signal reproducing means, an electric power source, drive circuit means receiving said saw-wave to correspondingly provide said still mode control signal to said bi-morph leaf means when said drive circuit means is powered by connection to said electric power source, switch means connecting said drive circuit means to said power source when said still signal reproducing mode is selected and disconnecting said drive circuit means from said power source when said normal signal reproducing mode is selected, and a capacitor connected through said switch means to said electric power source, said capacitor being charged through said switch means in said still signal reproducing mode, and said capacitor being discharged to temporarily supply electric power to said drive circuit means when said switch means disconnects the drive circuit means from said power source in said normal signal reproducing mode.

4,165,522

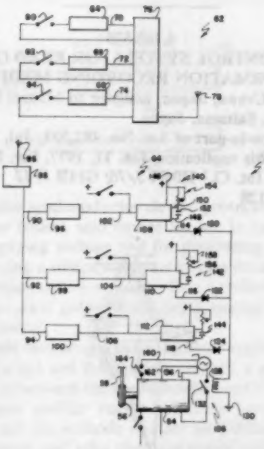
VIDEO RECORDER AND PLAYBACK UNIT INCLUDING REMOTELY OPERABLE TIMED FAST FORWARD ADVANCE

Godfrey T. Moller, Guaranty Bank Plz., Corpus Christi, Tex. 78475

Filed May 9, 1978, Ser. No. 904,230

Int. Cl.[2] G11B *15/46, 15/18*

U.S. Cl. 360—73 **12 Claims**



1. A video recorder and playback unit, comprising;

a medium of substantially uniform recording characteristics between first and second locations, means for receiving transmitted audio and visual signals, and means for continuously encoding a signal representative of the transmitted audio signal and a signal representative of the transmitted video signal on the medium between the first and second locations;

means for advancing the medium in a playback direction at a predetermined rate for playing back the encoded signals;

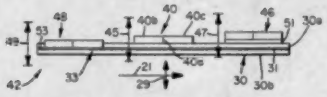
means including a picture tube and a speaker operatively associated with the medium during advancement in the playback direction for displaying an image on the picture tube representative of the video signal and for creating sound energy representative of the audio signal; and

means operable from a position remote from the picture tube during playback between the first and second locations for selectively advancing the medium in the playback direction a predetermined distance, independent of encoded signals, at a rate in excess of the predetermined rate.

4,165,523
AUTOMATIC SCAN TRACKING USING AN ADDITIONAL SENSING MEANS ON A BIMORPH

Richard A. Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,571
Int. Cl.[2] G11B 5/52, 21/10, 21/18
U.S. Cl. 360—77 32 Claims

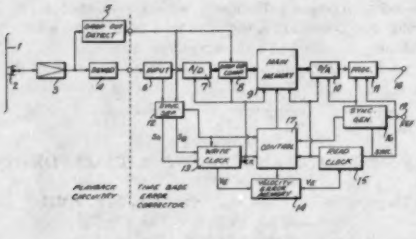


1. In a record/reproduce device having signal transducer means supported by mounting means for transducing data recorded along tracks on a record medium, comprising: an elongated positionable element extended between the mounting means and the transducing means for displacement of the transducing means in a generally transverse direction relative to the lengthwise direction of a subject track, sensing means mounted on said element adjacent the transducer means for continuously sensing two edges of one or more recorded tracks and developing a signal indicative of the lateral position of the transducer means with respect to said subject track during transduction of data with respect to said track for effecting transverse displacement of the transducer means with respect to said subject track during said transduction of data.

4,165,524
VELOCITY ERROR CONTROL APPARATUS

Takeshi Ninomiya, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,286
Claims priority, application Japan, May 31, 1977, 52/63727
Int. Cl.[2] H04N 5/78
U.S. Cl. 360—36 11 Claims



1. Velocity error control apparatus for use in a video signal time base corrector of the type including a main memory having addressable storage locations for storing successive lines of video signals, write-in means including a write-in clock signal generator synchronized with time base errors in said video signal for writing successive lines of video signals into addressed storage locations at a write-in clock rate, and read-out means including a controllable read-out clock signal generator for reading out successive lines of video signals from addressed storage locations at a substantially constant read-out clock rate, said velocity error control apparatus comprising:

velocity error detecting means for detecting velocity errors in successive lines of said video signals written into said main memory;

velocity error storage means having a plurality of storage locations, each being operative to store a signal representing the velocity error of an associated line of video signals;

velocity error read-out means for reading out from said velocity error storage means the velocity error signal associated with a line of video signals when said associated line of video signals is read out from said main memory;

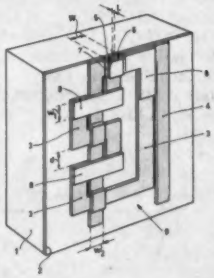
modifying means for modifying said read out velocity error signal with the velocity error signal associated with at least one adjacent line of video signals, said modifying means including means for defining a plurality of sections of a read out line of video signals and interpolating means for combining said read out velocity error signal with the velocity error signal associated with said at least one adjacent line of video signals to produce interpolated velocity error signals for respective ones of said sections of said read out line; and

modulating means for modulating the read-out clock signals with said modified velocity error signal to compensate for the velocity errors in successive lines of said video signals.

4,165,525
MAGNETIC HEAD HAVING A CORE PROVIDED ON A SUBSTRATE BY MEANS OF THIN-FILM TECHNOLOGY

Gerrit J. Koel, and Willem F. Druyvesteyn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 15, 1978, Ser. No. 877,825
Int. Cl.[2] G11B 5/12, 5/20
U.S. Cl. 360—125 3 Claims



1. A thin film magnetic transducing head which includes a non-magnetic substrate, a high permeability magnetic circuit structure of metallic ferromagnetic material disposed on said substrate and means for generating a magnetic flux in said magnetic circuit structure, said magnetic circuit structure having the form of a loop, said loop having two end portions which are positioned in spaced, overlapping relationship, said two end portions each being pole shoes which define a transducing gap between them, said flux generating means including an electrical conductor, a first portion of said conductor being located in said transducing gap, and wherein a portion of said loop forms a multiturn winding which is wound around a second portion of said electrical conductor.

4,165,526
MAGNETIC TAPE CLEANER

Dennis R. Jones, 38250 SE. Lusted Rd., Boring, Oreg. 97009

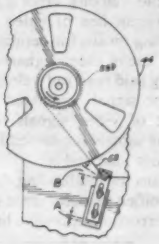
Filed Jan. 23, 1978, Ser. No. 871,709
Int. Cl.[2] G11B 5/41, 23/50
U.S. Cl. 360—137 5 Claims

1. For use in a magnetic tape recorder having a recording head positioned between a pair of take-up reels, a tape cleaner comprising:

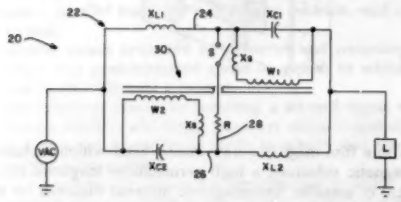
cleaning means including opposed cleaning elements each having a planar surface for receiving a stretch of tape therebetween and for wiping the tape on both sides thereof as the tape is drawn therethrough; and

mounting means for mounting said cleaning means on the recorder and for permitting said cleaning means to rotatably reorient in response to a change in the feed angle of the tape relative to said mounting means, said mounting

means also including a first member which is mounted on and shiftable relative to a second member, said first member supporting said cleaning means and said second member being mounted on the recorder.



4,165,527
CURRENT LIMITING CIRCUIT ARRANGEMENT
Derek A. Paice, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Jan. 11, 1978, Ser. No. 868,683
Int. Cl.[2] H02H 9/04
U.S. Cl. 361—113 **11 Claims**



5. A current limiting circuit arrangement comprising:

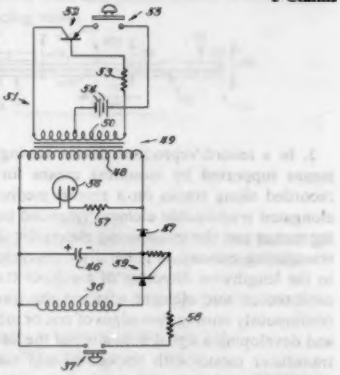
(a) a first circuit including inductive reactance and capacitive reactance which are connected together in series and tuned to resonate at a given frequency;

(b) a second circuit substantially identical to said first circuit and connected in parallel therewith during normal operation of the circuit arrangement;

(c) a third circuit connected across said first and second circuits and including a resistor and means for opening said third circuit during said normal operation and closing said third circuit in response to predetermined abnormal operation conditions of the circuit arrangement; and

(d) means for maintaining the voltage across the capacitive reactance in said first circuit and the voltage across the capacitive reactance in said second circuit equal to one another during said normal operation when said first and second circuits are in parallel whereby to maintain the current through said first and second circuits equal even though the capacitive reactances in the first and second circuits vary from one another, so long as these latter circuits remain parallel and their inductive reactances remain equal, said means including a voltage transformer having a pair of windings with a 1:1 turns ratio, one of said windings being connected across one of said capacitive reactances and the other winding being connected across the other capacitive reactance.

4,165,528
FAULT INDICATOR AND MEANS FOR RESETTING SAME
Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60062
Division of Ser. No. 708,549, Jul. 26, 1976, Pat. No. 4,086,529.
This application Feb. 13, 1978, Ser. No. 877,470
Int. Cl.[2] G01R 31/02
U.S. Cl. 361—156 **5 Claims**



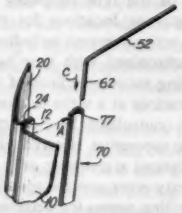
1. Means for resetting the pivoted target of a fault indicator of the type having a generally cylindrical housing, a target mounted for rotation in a plane generally perpendicular to the axis of said housing at one end thereof and including a target permanent magnet mounted for rotation with said target, a stationary permanent magnet within said housing for biasing said target magnet to position said target in a fault indicating position, and means including a pair of demagnetizable pole pieces extending longitudinally in parallel-shaped relationship within said housing for biasing said target magnet to position said target in a reset position, comprising in combination:

a receptacle dimensioned for telescopic engagement with said housing;

a winding coaxially disposed within said receptacle for magnetic communication with said pole pieces when said housing is seated in said receptacle; and

means for energizing said winding from a source of direct current.

4,165,529
LAMP SHADE AND KNOCK-DOWN KIT FOR FORMING SAME
Allan Hagelthorn, 66 E. 80 St., New York, N.Y. 10021
Filed Jan. 23, 1978, Ser. No. 871,555
Int. Cl.[2] F21V 1/06
U.S. Cl. 362—352 **12 Claims**



1. A knock-down kit for forming a lamp shade and analogous articles, comprising:

(a) a plurality of panels each having opposed longitudinally-extending side edge regions;

means for snappingly engaging adjacent side edge regions of each two adjacent panels, including

a plurality of longitudinally-extending ribs each having a

pair of wall portions bounding a generally U-shaped channel, at least one of said wall portions of each rib being resilient and movable away from the other of said wall portions of the respective pair, in response to insertion of a panel side edge region into an associated channel, between a non-clamped position, and a clamped position in which said wall portions of each pair receive therebetween with snap-type closure action a side edge region of one panel and a side edge region of another adjacent panel; and

(c) means for supporting said snappingly-engaged panels in a predetermined assembled orientation relative to each other, including

a plurality of support elements each mountable on a respective rib to thereby form a lamp shade.

4,165,530

ARTICULATED-ARM SUPPORTING MEMBER, ESPECIALLY FOR LAMPS

George J. Sowden, Milan, Italy, assignor to I Guzzini S.P.A., Recanati, Italy

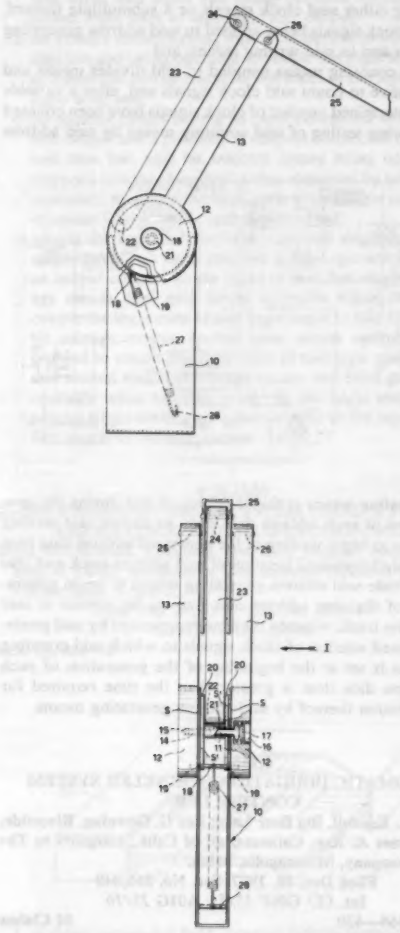
Filed Jul. 25, 1978, Ser. No. 927,897

Claims priority, application Italy, Jul. 28, 1977, 26262 A/77

Int. Cl.[2] F21V *21/26*

U.S. Cl. 362—401 **5 Claims**

1. An articulated-arm support device for lamps, comprising: a support member having an upper portion formed as a pair of parallel upwardly extending walls; a pair of side arms terminating at one end with disclike heads external with respect to said parallel walls of the supporting member and being coaxially pivoted to said parallel walls through a traverse pin; a central arm having one end eccentrically pivoted to a pair of mutually spaced lateral discs, coaxially and pivotally mounted on said pin internally to said walls of said supporting member; a further arm, pivoted to the other end of said central and side arms; first resilient means being associated with said pin adapted to resiliently force said heads, walls and discs along the axis of said pin and to provide for frictional engagement therebetween; and second resilient means acting between said supporting member and at least one of said pivoted heads to balance the arm assembly.



4,165,531

DATA GENERATOR FOR DISC FILE ADDRESSES

Peter L. Krause, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 220,397, Jan. 24, 1972, abandoned, which is a continuation of Ser. No. 866,502, Oct. 15, 1969, abandoned. This application Apr. 21, 1977, Ser. No. 789,395

Int. Cl.[2] G06F *13/04*

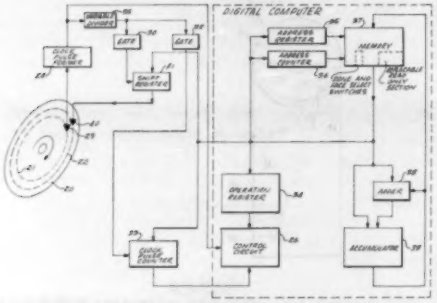
U.S. Cl. 364—200 **3 Claims**

1. In an address writing system having address generating means responsive to applied clock signals for sequentially generating address data items to be written at spaced predetermined locations in an address track of a moving information storage medium, wherein the number of applied clock singals required by said address generating means for generating an address data item is variable, the improvement comprising:

writing means responsive to said address generating means for sequentially writing address data items in said address track of said storage medium;

clock means for producing a series of clock signals synchronized with the movement of said storage medium, said clock means including divider means for selectively providing either said clock signals or a submultiple thereof, said clock signals being applied to said address generating means and to said writing means; and

settable counting means coupled to said divider means and operative to count said clock signals and, after a variable predetermined number of clock signals have been counted following setting of said counting means by said address



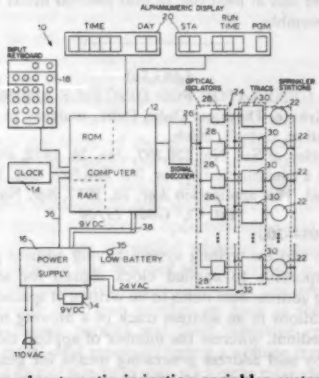
generating means at the beginning of and during the generation of each address data item, to initiate said writing means to begin writing of the generated address data item at a predetermined location of said address track and also to initiate said address generating means to begin generation of the next address data item to be written in said address track, wherein the time represented by said predetermined number of clock signals to which said counting means is set at the beginning of the generation of each address data item is greater than the time required for generation thereof by said address generating means.

4,165,532

AUTOMATIC IRRIGATION SPRINKLER SYSTEM CONTROLLER

Thomas L. Kendall, Big Bear Lake; Leo G. Downing, Riverside, and James A. Ray, Calimesa, all of Calif., assignors to The Toro Company, Minneapolis, Minn.

Filed Dec. 30, 1977, Ser. No. 866,049
Int. Cl.² G06F *15/56*; A01G *25/16*
U.S. Cl. 364—420 **14 Claims**



1. Improved automatic irrigation sprinkler system control apparatus comprising:

(a) power supply means adapted to be connected to a source of A.C. power for providing a first voltage output pair for operating logic and display circuitry and a second voltage output pair for operating a sprinkler system valve;

(b) at least one solid state switch having a power input, a power output, and control input, said power input being connected to one of said second voltage output pair;

(c) at least one voltage isolator means for passing a signal having an electrically isolated input and output, said output being connected to said control input of said at least one solid state switch; and,

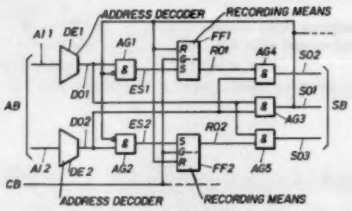
(d) solid state control means having a power input connected to said first voltage output pair and a control signal output connected to said input of said at least one voltage isolator means for maintaining a real-time clock, continuously comparing the real-time clock value to preselected start times, and outputting control signals at said control signal output for preselected durations when ones of said preselected times equal the current real-time value whereby a sprinkler system valve can be connected between said power output and the other of said second voltage output pair and be controlled by said at least one solid state switch in response to signals at said control input.

4,165,533

IDENTIFICATION OF A FAULTY ADDRESS DECODER IN A FUNCTION UNIT OF A COMPUTER HAVING A PLURALITY OF FUNCTION UNITS WITH REDUNDANT ADDRESS DECODERS

Björn E. R. Jonsson, Järfälla, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 29, 1977, Ser. No. 865,534
Claims priority, application Sweden, Jan. 28, 1977, 7700957
Int. Cl.² G06F *11/06*
U.S. Cl. 364—900 **5 Claims**



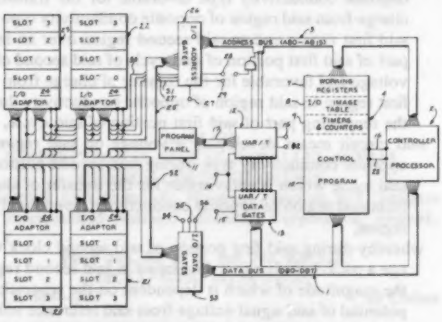
1. In a system including a number of addressable function units which are connected to a central control unit via a common bus system and, for safety reasons, are furnished with duplicated address decoders, an apparatus in each of said function units for identifying a faulty address decoder in one function unit which is operated when another function unit was actually addressed, said apparatus comprising in each function unit an arrangement of logic circuits being connected to the outputs of the two address decoders of the function unit and being arranged to supply three indication signals; a first indication signal when only the first one of said two address decoders has detected a certain address being sent from the central control unit, a second indication signal when only the second one of said two address decoders has detected said certain address and a third indication signal when both of said two address decoders have detected said certain address; first and second bistable recording means being set by said first and

second indication signal, respectively; a first reading logic circuit controlled by the second one of said two address decoders for reading out a recording made in said first recording means upon detection of said certain address; a second reading logic circuit controlled by the first one of said two address decoders for reading out a recording made in said second recording means upon detection of said certain address; first and second output means for transferring to said common bus system the readings from said first and second reading logic circuits, respectively; and a third reading logic circuit connected to both of said address decoders for transferring to said common bus system said third indication signal when both address decoders are activated simultaneously but later than said first or second reading logic circuit if its associated recording means has been previously set due to a fault, said recording means having reset inputs connected to the output of said third reading logic circuit.

4,165,534
DIGITAL CONTROL SYSTEM WITH BOOLEAN PROCESSOR

Ernst Dummermuth, Chesterland; Raymond A. Grudowski, South Euclid; Valdis Grants, Lyndhurst, and Otomar Schmidt, North Olmstead, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation of Ser. No. 790,251, Apr. 25, 1977, abandoned. This application Jun. 1, 1978, Ser. No. 911,520
Int. Cl.[2] G05B *11/01, 19/02;* G06F *9/06*
U.S. Cl. 364—900 **10 Claims**



1. A programmable controller comprising:

a memory which stores on selected memory lines an I/O image table comprised of a plurality of multi-bit status words, a plurality of controller instructions which comprise a control program, and a set of machine instructions;

an address bus connected to said memory to select a memory line therein;

a data bus connected to said memory to couple data to and from said memory;

an I/O interface rack coupled to said address bus and said data bus, said I/O interface rack including input and output circuits for coupling the data bus to sensing devices and operating devices on a machine to be controlled;

a microprocessor responsive to selected machine instructions to sequentially read said controller instructions out of said memory, responsive to other selected machine instructions to read selected status words out of said memory, responsive to other machine instructions to write status words into selected memory lines of said I/O image table, and responsive to other machine instructions to couple status words between said I/O image table and associated input and output circuits in said I/O interface rack; and

a Boolean processor coupled to said data bus and including:

a. a logic unit having an input and an output and including a first single-bit storage means having an input coupled to the logic unit input and an output coupled to the logic unit output, said logic unit being operable to store a logic state which corresponds to the logic state of a signal coupled to said logic unit input and being operable to couple said stored logic state to said logic unit output;

b. bit pointer means having inputs connected to leads in said data bus and being operable to couple the logic state signal of a selected one of said data bus leads to the input of said logic unit; and

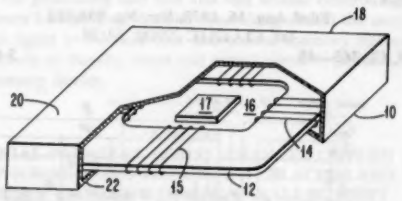
c. bit selector means having an input connected to said logic unit output and a plurality of outputs connected to leads in said data bus, said bit selector means being operable in response to a machine instruction executed by said microprocessor to couple the logic state at said logic unit output to one of said leads in said data bus; and

in which the logic unit includes a second single-bit storage means having an input coupled to the logic unit input and an output coupled to the input of said first single-bit storage means, first gate means operable when enabled to couple the logic state of said logic input to said first single-bit storage means, second gate means operable when enabled to couple the logic state of said logic unit input to said second single-bit storage means, and third gate means operable when enabled to couple the logic state of said second single-bit storage means output to the input of said first single-bit storage means.

4,165,535
BUBBLE MEMORY DRIVE SYSTEM USING A PICTURE FRAME CORE AND A REFLECTION BOX

Joost Mortelmans, Campbell, and Otto Voegeli, Morgan Hill, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1977, Ser. No. 838,347
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 **6 Claims**



1. A drive system for field accessed bubble memory devices containing at least one bubble chip comprising:

a drive assembly, and

a closed electrically conducting enclosure having said drive assembly positioned therein, said enclosure providing circumferentially continuous electrical current paths about said drive assembly to reflect the magnetic drive field surrounding said drive assembly.

4,165,536
MAGNETIC BUBBLE PACKAGE

Wilbur T. Layton, San Diego, and Sidney J. Schwartz, Vista, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 11, 1978, Ser. No. 933,054
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 **12 Claims**

1. A magnetic bubble package having an assembly of bubble memory components comprising:

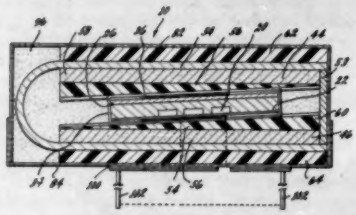
bubble memory chip means,

printed circuit board means having a flexible portion and a rigid portion, said bubble memory chip means being mounted on said rigid portion with said flexible portion extending outwardly therefrom,

said printed circuit board means containing electrical conductor means for interchip communication and for communication to external devices,

a plurality of drive coils for providing a magnetic field rotating in the plane of said chip means,

means defining chamber means formed in part by said rigid portion of said circuit board for spacing said drive coils from said chip means,



yoke means with legs spaced from but juxtaposed said coils and having parallelepiped-shaped bias magnets located with respect to said drive coils and said chip means to provide a magnetic field normal to the plane of said chip means, and

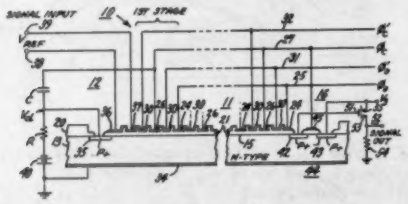
discrete wedge-shaped taper means disposed between said bias magnets and said coil means for positioning chip means with respect to said bias magnets to provide a magnetic gradient on said chip means.

4,165,537

ANALOG CHARGE TRANSFER APPARATUS

William E. Engeler, and Richard D. Buertsch, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,012
Int. Cl.[2] G11C *27/00, 19/28*
U.S. Cl. 365—45 **5 Claims**



1. Charge transfer apparatus comprising

a semiconductor substrate of one conductivity type having a major surface,

a first electrode insulatingly overlying a first region of said substrate adjacent said major surface,

a second electrode insulatingly overlying a second region of said substrate adjacent said major surface and contiguous to said first region,

a region of opposite conductivity type in said major surface and coupled to said first region,

means for applying a reference voltage to said first electrode to establish a surface potential in said first region corresponding to said reference voltage,

means for applying a signal voltage to said second electrode to establish a surface potential in said second region corresponding to said signal,

means for biasing said region of opposite conductivity type to provide a surface potential therein of a value unfavorable for the transfer of charge from said region of opposite conductivity type to said first region,

a third electrode insulatingly overlying a third region of said substrate adjacent said major surface and contiguous to said second region,

a fourth electrode insulatingly overlying a fourth region of said substrate adjacent said major surface and contiguous to said third region,

means for applying a first clock voltage to said third electrode to establish a surface potential in said third region corresponding to said first clock voltage,

means for applying a second clock voltage to said fourth electrode to establish a surface potential in said fourth region corresponding to said second clock voltage,

said second clock voltage having a first value over a first portion of a cycle thereof which is unfavorable for the transfer of charge from said second region to said fourth region and having a second value over a second portion of said cycle which is favorable for the transfer of charge from said second region to said fourth region,

said first clock voltage having a first value during said first portion of said cycle of said second clock voltage which inhibits the transfer of charge from said second region to said fourth region and having a second value during said second portion of said cycle of said second clock voltage which enables the transfer of charge from said second region to said fourth region,

passive circuit means responsive to the transition in level of said second clock voltage from said second value to said first value to develop and apply a transient voltage of a polarity, amplitude and duration to said region of opposite conductivity type to render the potential of said region of opposite conductivity type favorable for the transfer of charge from said region of opposite conductivity type into said first region and to said second region over an initial part of said first portion of said cycle of said second clock voltage and favorable for the transfer of charge from said first region to said region of opposite conductivity during the remaining part of said first portion of said cycle,

said circuit means developing a voltage on said region of opposite conductivity type during said second portion of said cycle which is unfavorable for the transfer of charge from said region of opposite conductivity type to said first region,

whereby during said first portion of said second clock voltage a packet of charge is developed in said second region, the magnitude of which is dependent on the separation in potential of said signal voltage from said reference voltage in the direction favorable to the transfer of charge from said first region to said second region, and during said second portion of said cycle of said second clock voltage said packet of charge is transferred from said second region to said fourth region.

4,165,538

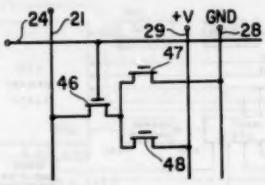
READ-ONLY MEMORY

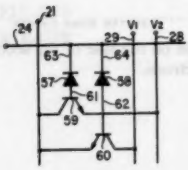
Yoshishige Kitamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,525
Claims priority, application Japan, Mar. 23, 1977, 52/32559
Int. Cl.[2] G11C *17/00, 17/06*
U.S. Cl. 365—104 **6 Claims**

1. A read-only memory comprising a plurality of word lines, a plurality of bit lines, a first potential source, a second potential source, and a plurality of memory cells disposed at cross-points between said word lines and said bit lines, each of said memory cells including a pair of programmable nonvolatile first gating means, into which information is written to make said pair of programmable nonvolatile first gating means conductive and nonconductive, respectively, and second gating means for operatively coupling an associated one of said bit lines with one of said first and second potential sources in response to one of said pair of programmable nonvolatile

gating means being conductive, said second gating means having a control means and being operative at the time the





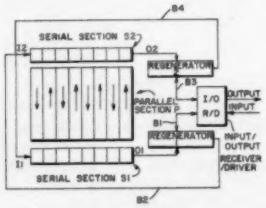
potential level of an associated one of said word lines is at a predetermined value.

4,165,539

BIDIRECTIONAL SERIAL-PARALLEL-SERIAL CHARGE-COUPLED DEVICE

Frederick J. Aichelmann, Jr., Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,922
Int. Cl.[2] G11C *11/34, 19/28*
U.S. Cl. 365—183 **10 Claims**



2. In an interlaced SPS CCD memory, the improvement comprising:

first and second serial registers;

a parallel section;

means for alternately transferring a serial data bit stream into said first and second serial registers;

means for transferring data bits in parallel from each said first and second registers into said parallel section;

means for propagating alternate rows of data bits within said parallel section in opposite directions until data is transferred in parallel from said parallel section into each said first and second serial registers; and

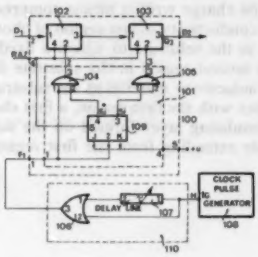
means for alternately reading out data bits from said first and second serial registers.

4,165,540

METHOD FOR STORING A BINARY SIGNAL IN A HIGH SPEED FLIP FLOP MEMORY HAVING CONTROLLED MINIMUM CHANGEOVER TIME AND APPARATUS THEREFOR

Daniel Vinot, Sucy-en-Brie, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 6, 1977, Ser. No. 857,911
Claims priority, application France, Dec. 28, 1976, 76 39314
Int. Cl.[2] G11C *7/00*
U.S. Cl. 365—190 **14 Claims**



2. A high speed flip-flop memory device for storing a binary signal comprising a first and a second memory element connected in cascade, means for introducing the binary signal to be stored in the memory device into said first memory element under the control of a first control signal, means for transferring the binary signal from said first memory element to said second memory element under the control of a second control signal, means for generating, from a single pulse, a clock signal comprising two pulses which are displaced in time, means responsive to the time displaced pulses generated by the first means for generating said first and said second control signal and means for applying the first control signal and the second control signal to the said first and second memory elements respectively to thereby cause said binary signal to be stored in said memory device.

4,165,541

SERIAL-PARALLEL-SERIAL CHARGE-COUPLED DEVICE MEMORY HAVING INTERLACING AND RIPPLE CLOCKING OF THE PARALLEL SHIFT REGISTERS

Ramesh C. Varshney, Sunnyvale; Kalyanasundaram Venkateswaran, San Jose, and Gilbert F. Amelio, Saratoga, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 12, 1977, Ser. No. 860,001
Int. Cl.[2] G11C *7/00, 21/00*
U.S. Cl. 365—219 **13 Claims**

1. A charge coupled device memory device having a data input terminal and a data output terminal comprising:

a plurality of blocks of memory, each block including

(1) an array of charge coupled memory cells for storing data in a serial-parallel-serial arrangement of shift registers, said array having an input terminal and an output terminal,

(2) charge writing means connected to the input terminal for injecting a signal charge into the array,

(3) sense amplifier means connected to the output terminal for detecting the signal charge at the output terminal and producing an output signal in response thereto,

(4) input logic means connected to each of the charge writing means, the sense amplifier means, and the data input terminal and connected to receive first address signals to determine when the charge writing means is to be activated to inject charge into the array in re-

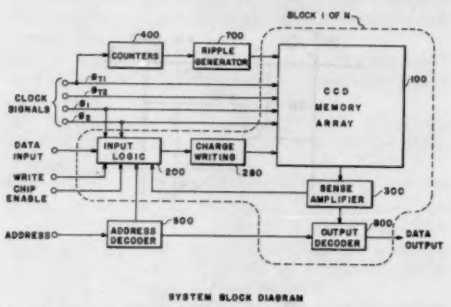
sponse to signals from one of the data input terminal and the sense amplifier means,

(5) output decoding means connected to the sense amplifier means and connected to receive second address signals to determine when the output signal from the sense amplifier means is to be supplied to the data output terminal,

means for generating the first and second address signals to thereby select any of the plurality of blocks of memory and connect said block to at least one of the data input terminal and data output terminal, and

clock means for controlling the operation of each of the blocks of memory,

wherein the charge writing means comprises a substrate of chosen conductivity, a first region of chosen conductivity formed in the substrate to which a fixed potential is applied, a second region in the substrate formed from the same conductivity material as the substrate and nowhere in contact with the first region, a first electrode disposed on an insulating layer formed on the substrate and said electrode extending from the first region to the second region, and a second electrode disposed on the insulating layer above the second region and the substrate adjacent



SYSTEM BLOCK DIAGRAM

the second region on the side of the second region opposite the first electrode.

DESIGN PATENTS

GRANTED AUG. 21, 1979

ERRATA

For CLASS	See PATENT NO.
D21–017	252,711
D21–208	252,712
D21–024	252,713
D21–078	252,714
D03–078	252,715

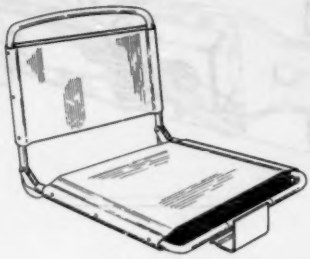
DESIGNS

AUGUST 21, 1979

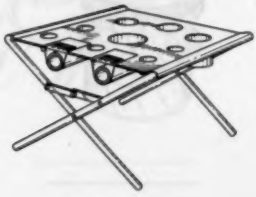
252,656
BODY BRIEFER
Magnhild L. Bergh, Hamden, Conn., assignor to The Strouse, Adler Company, New Haven, Conn.
Filed Feb. 24, 1977, Ser. No. 772,899
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—3

252,657
HANDLE FOR A HANDBAG
Helen Young, Roslyn, N.Y., assignor to N A S Import Corp., New York, N.Y.
Filed Dec. 30, 1977, Ser. No. 866,200
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—54

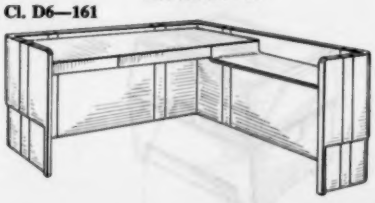
252,658
PORTABLE SEAT
Richard H. Kressin, 16 Windsor Ave., Scarborough, Ontario, Canada (M1N 1A7)
Filed Jul. 26, 1977, Ser. No. 819,587
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—41



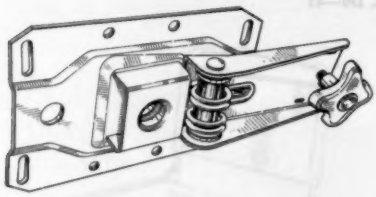
252,659
PORTABLE FOLDABLE BAR
Harold Brickman, 2911 W. Catalpa, Chicago, Ill. 60625
Filed Jul. 5, 1977, Ser. No. 813,083
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—144



252,660
DESK
Lawrence Lerner, New York, N.Y., and Fred Schmitt, Nutley, N.J., assignors to Litton Business Systems, Inc.
Filed Feb. 22, 1977, Ser. No. 770,328
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

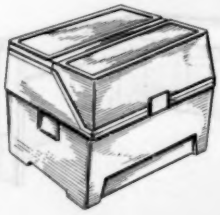


252,661
SWIVEL POSTURE CHAIR CONTROL
Vincent G. Bowman, Baden, Canada, assignor to Doerner Products Co. Limited, Waterloo, Canada
Filed Sep. 22, 1977, Ser. No. 835,769
Claims priority, application Canada, Mar. 30, 1977, 3003773
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

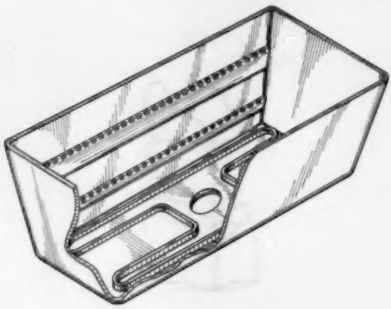


252,662
COMBINED CHEESE GRATER AND CONTAINER
William E. Bounds, 23790 Hawthorne Blvd., Torrance, Calif. 90505
Filed Apr. 21, 1977, Ser. No. 789,542
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47

252,663
PORTABLE INSULATED FOOD CHEST OR THE LIKE
Louis J. Corini, Philadelphia, Pa., assignor to Fogel Commercial Regrigerator Company, Philadelphia, Pa.
Filed Feb. 7, 1977, Ser. No. 766,141
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—77



252,664
BARBECUE GRILL BODY
George W. Hall, Omaha, Nebr., assignor to Don Hall Company, Omaha, Nebr.
Filed Apr. 11, 1977, Ser. No. 786,629
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—109



252,665
ELECTRIC MINI-OVEN WITH REMOVABLE COVER
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and Francis J. Greb, Palatine, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Mar. 7, 1977, Ser. No. 775,249
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—126

252,666
VINYL PIPE CUTTER
Masaharu Sakamoto, Tsu, Japan, assignor to Matsuzaka Iron Works, Inc., Tsu, Japan
Filed Apr. 18, 1977, Ser. No. 788,635
Claims priority, application Japan, Oct. 20, 1976, 51-41516
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—60

252,667
FLOOR PULLEY CORD LOCK
Vincent H. Muttart, Placentia, Calif., assignor to Spring Crest Company, Brea, Calif.
Filed May 1, 1978, Ser. No. 901,723
Term of patent 14 years
Int. Cl. D8—*08, 09*
U.S. Cl. D8—360

252,668
DRAPERY ROD
Robert S. Rudinski, 515 East St., Elkhart, Ind. 46514
Filed May 3, 1977, Ser. No. 793,441
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—377

252,669
TRACK STIRRUP
Vincent H. Muttart, Placentia, Calif., assignor to Spring Crest Company, Brea, Calif.
Filed May 1, 1978, Ser. No. 901,724
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—380

252,670
BOTTLE OR SIMILAR ARTICLE
Everett C. Beeman, Wallingford, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed May 25, 1977, Ser. No. 800,454
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

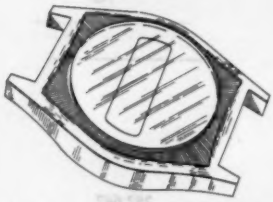
252,671
BOTTLE
Gordon A. Strand, 1513 Bradmore Dr., Toledo, Ohio
Filed Apr. 14, 1977, Ser. No. 787,402
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—129

252,672
BOTTLE
Thomas B. Aldrich, III, Spring Valley, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 8, 1977, Ser. No. 775,492
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—137

252,673
BOTTLE OR SIMILAR ARTICLE
Everett C. Beeman, Wallingford, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed May 25, 1977, Ser. No. 800,456
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143

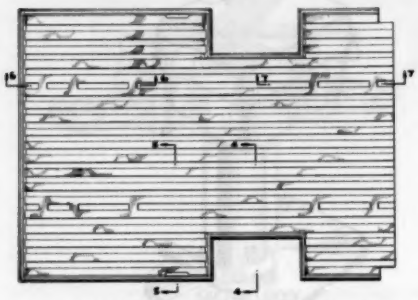
252,674
COMBINED BOTTLE AND CLOSURE THEREFOR OR SIMILAR ARTICLE
Everett C. Beeman, 26 Norman Ave., Wallingford, Conn. 06492
Filed May 25, 1977, Ser. No. 800,455
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—144

252,675
WRIST WATCH
Eugene J. Sulek, Lubbock, Tex., and Walter S. Nakano, Burbank, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 6, 1977, Ser. No. 830,718
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

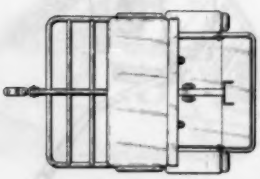


252,676
PLAQUE
Gaye L. Daugherty, 12643 Promenade, Dallas, Tex. 75238
Filed Feb. 22, 1977, Ser. No. 770,401
Term of patent 14 years
Int. Cl. D11—*02*; D6—*07, 08*
U.S. Cl. D11—132

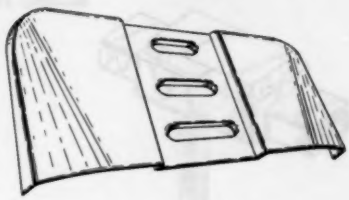
252,677
TRUCK BED LINER
Sam M. Richardson, III, c/o Viking Industries, Inc., P.O. Box 1582, Industrial Rd., El Dorado, Ark. 71730
Filed Jun. 13, 1977, Ser. No. 806,099
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—98



252,678
GOLF CART TRAILER
R. Kelley Jackson, 665 S. Alton Way, Denver, Colo. 80231
Filed Jul. 21, 1977, Ser. No. 817,838
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—101

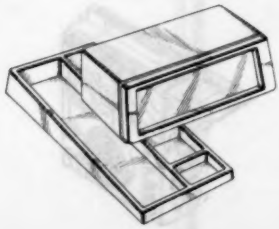


252,679
AIR DEFLECTOR
Ronald L. Welden, 5912 Mohawk Dr., San Jose, Calif. 95123, and Richard L. Short, Santa Cruz, Calif., assignors to Ronald L. Welden, San Jose, Calif.
Filed Jul. 21, 1977, Ser. No. 817,544
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

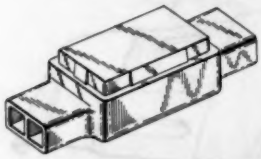


252,680
EXTERIOR VISOR FOR VEHICLES
Michael C. Kingsley, and Richard J. Kingsley, both of P.O. Box 44338, Tacoma, Wash. 98444
Filed May 2, 1977, Ser. No. 793,174
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191

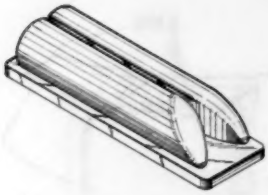
252,681
CONTROL CONSOLE
Wayne A. Current, Holmdel, N.J., assignor to The Singer Company
Filed Apr. 20, 1977, Ser. No. 789,167
Term of patent 14 years
Int. Cl. D13—*03;* D14—*02*
U.S. Cl. D13—12



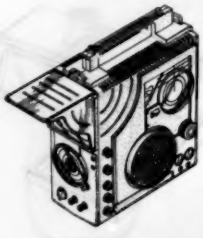
252,682
ELECTRICAL CONNECTOR
Sidney J. Berglund, Stillwater, and Dewain R. Goff, St. Paul Park, both of Minn., assignors to Minnesota Mining and Manufacturing Company
Filed May 19, 1977, Ser. No. 798,438
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



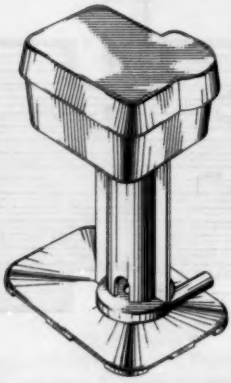
252,683
CARD READER HEAD ASSEMBLY
Edward P. Sheehan, Canton; John P. Connolly, Hingham, both of Mass., and James B. King, McLean, Va., assignors to Massachusetts Bay Transportation Authority
Filed Oct. 11, 1977, Ser. No. 840,844
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



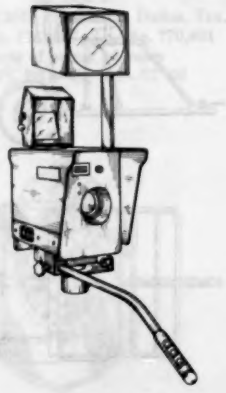
252,684
COMBINED TELEVISION AND RADIO RECEIVER
Yasusuke Seki, and Takeshi Abe, both of Tokyo, Japan, assignors to Hitachi, Ltd.
Filed Apr. 14, 1977, Ser. No. 787,504
Claims priority, application Japan, Jan. 31, 1977, 52-2551
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—72



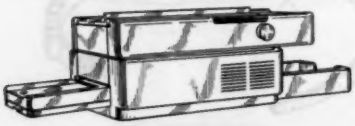
252,685
EVAPORATIVE COOLER PUMP
Duane K. Johnston, 9041 N. 33rd Way, Phoenix, Ariz. 85028
Filed Jun. 16, 1978, Ser. No. 916,239
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



252,686
TRANSPORTABLE CAMERA
Rüdolf Viering, Cologne, Fed. Rep. of Germany, assignor to Pixyfoto GmbH, Cologne, Fed. Rep. of Germany
Filed Oct. 29, 1976, Ser. No. 736,903
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—02

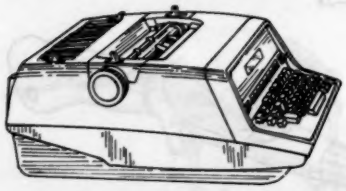


252,687
COPYING MACHINE
Norbert Schlagheck, and Herbert Schultes, both of Fuerstenfeldbruck, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany
Filed Feb. 23, 1977, Ser. No. 771,253
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1976, 492
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—31



252,688
MUSIC BOX
Chong T. Ahn, 923 Fulton Ave., San Leandro, Calif. 94577
Filed Mar. 13, 1978, Ser. No. 885,550
Term of patent 14 years
Int. Cl. D17—*05*
U.S. Cl. D17—24

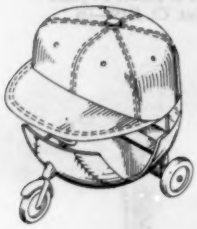
252,689
TYPEWRITER FOR WORD PROCESSOR
Farouk Arjani, Foster City; Thomas J. Kramer, San Jose; Richard E. Johnson, Los Altos; Ralph M. Swan, Sunnyvale; David C. Andersen, Cupertino, and David D. Pharmer, Gilroy, all of Calif., assignors to Artec International Corporation, Palo Alto, Calif.
Filed Mar. 14, 1977, Ser. No. 777,307
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—2



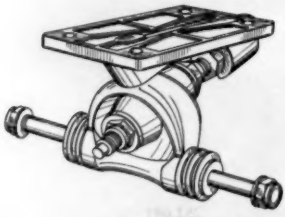
252,690
COMBINED HOROLOGICAL AND WRITING INSTRUMENT
Hon Wai Wong, Lot 329, Section A, Ground Floor, Ting Kau, New Territories, Hong Kong
Filed Nov. 4, 1976, Ser. No. 738,971
Claims priority, application United Kingdom, Sep. 8, 1976, 977069
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—36

252,691
WRITING INSTRUMENT
Curtis L. Malm, Quincy, Mass., and Clarence Zierhut, Richardson, Tex., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 2, 1978, Ser. No. 874,566
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

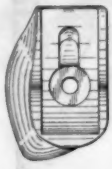
252,692
SIMULATIVE TOY VEHICLE
Joseph Petrisco, 673 Bend Dr., Sunnyvale, Calif. 94087
Filed Aug. 1, 1977, Ser. No. 821,290
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—128



252,693
SKATEBOARD TRUCK
William H. Brawner, El Cajon, Calif., assignor to H.P.G. IV, Inc., El Cajon, Calif.
Filed Mar. 3, 1978, Ser. No. 883,345
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226



252,694
ONE PIECE HANDGUN GRIP OR SIMILAR ARTICLE
Theodore L. Schiermeier, P.O. Box 704, Twin Falls, Id. 83301
Filed Sep. 3, 1976, Ser. No. 720,232
The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1



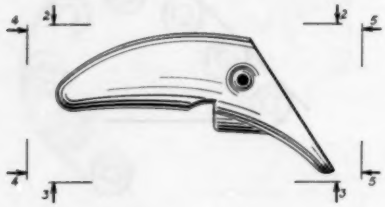
252,695
CARTRIDGE BELT
Ethiel L. Munz, P.O. Box 1383, Hawaiian Garden, Calif. 90716
Filed Jul. 14, 1977, Ser. No. 815,517
Term of patent 14 years
Int. Cl. D22—*05;* D2—*07*
U.S. Cl. D22—14

252,696
SWITCH FOR KILLING INSECTS
Nicholas M. Mushkin, 4755 E. Flamingo, Las Vegas, Nev. 89109
Filed Apr. 11, 1977, Ser. No. 786,086
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—20

252,697
HANDLE FOR FISHING ROD ASSEMBLY
Ryuichi Ohmura, No. 19-3, Minami-cho, Shizuoka-ken, Shizouka-shi, Japan
Filed Sep. 30, 1977, Ser. No. 838,331
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

252,698
FISHING JIG
Harris C. Jackson, 2500 Pine St., Napa, Calif. 94558
Filed Aug. 31, 1977, Ser. No. 829,564
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

252,699
FISHING PLUG
James D. Maxwell, P.O. Box 649, Vancouver, Wash. 98660
Filed Aug. 29, 1977, Ser. No. 828,327
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

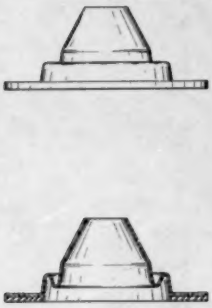


252,700
FISHING LURE
Fred C. Young, Oak Ridge, Tenn., assignor to Cordell Tackle, Inc., Hot Springs, Ark.
Filed Sep. 21, 1977, Ser. No. 835,429
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

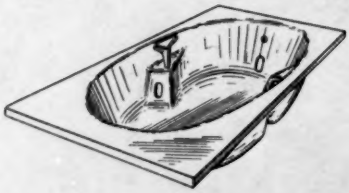
252,701
VALVE CORE
Jerry L. Caldwell, 1818 Fairfax, Carrollton, Tex. 75006
Filed May 18, 1977, Ser. No. 797,996
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

252,702
SUBTERRANEAN WATER DRAIN
John A. Armistead, Charlotte, N.C., assignor to Polyphase Corporation, Charlotte, N.C.
Filed Mar. 14, 1977, Ser. No. 777,009
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

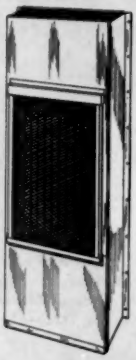
252,703
PIPE FLASHING
George M. Cupit, 5 Waldheim Rd., Bayswater, Victoria, Australia
Filed Jul. 13, 1977, Ser. No. 815,271
Claims priority, application Australia, Jan. 14, 1977, 71012
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42



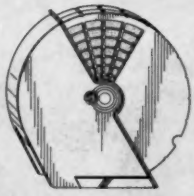
252,704
BATHTUB
Ian R. Read, Reigate, England, assignor to Nordic Saunas Limited, Reigate, England
Filed Nov. 21, 1977, Ser. No. 853,564
Claims priority, application United Kingdom, Sep. 28, 1977, 981712
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



252,705
ELECTRIC AIR CONDITIONER FOR ELECTRONIC ENCLOSURES
Herman S. Fessler, Coon Rapids, Minn., assignor to McLean Engineering Midwest, Maple Grove, Minn.
Filed Mar. 10, 1977, Ser. No. 776,149
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—144

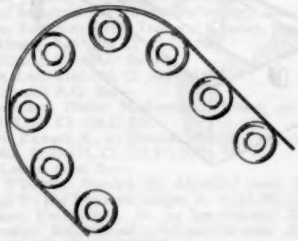


252,706
DISPENSER FOR AIR TREATING MATERIAL
Georg Schimanski, Hagen, Fed. Rep. of Germany, assignor to Globol-Werk GmbH, Fed. Rep. of Germany
Filed Mar. 4, 1977, Ser. No. 774,346
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 309
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

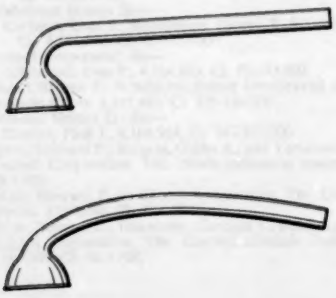


252,707
INHALER
Joel Besnard, 130 W. 47th St., #3D, New York, N.Y. 10036
Filed Jan. 3, 1977, Ser. No. 756,396
Term of patent 14 years
Int. Cl. D24—*99*; D27—*99*
U.S. Cl. D24—62

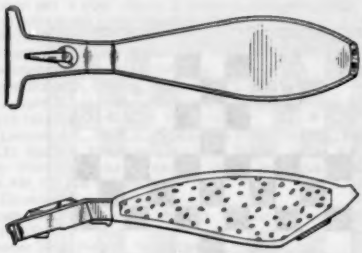
252,708
GO-CART GUARD RAIL
Clarence K. Vincent, 3023 Tilden, Houston, Tex. 77025
Filed Jul. 20, 1977, Ser. No. 817,236
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—38



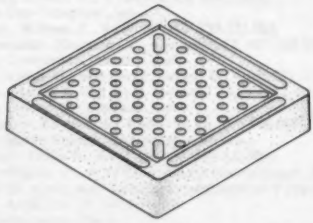
252,709
LOTION APPLICATOR
Flora J. MacFadden, 6392 Santa Rita Ave., Garden Grove, Calif. 92645
Filed Nov. 16, 1978, Ser. No. 961,060
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7



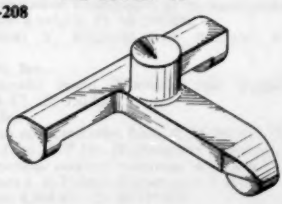
252,710
RAZOR
John M. Picinic, 330 9th St., Palisade Park, N.J. 07650
Filed May 25, 1977, Ser. No. 800,102
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46



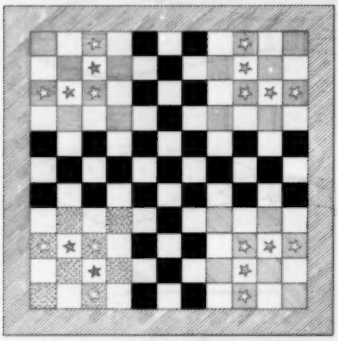
252,711
BASE MEMBER FOR PARLOR GAME
David L. White, and Beverly A. White, both of 32560 Mason Ct., Westland, Mich. 48185
Filed Sep. 26, 1977, Ser. No. 836,695
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—17



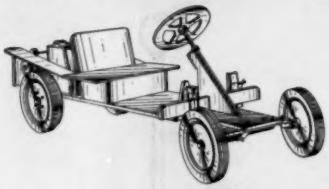
252,712
GOLF TEE
Arthur S. Bradley, 342 N. 116th St., Wauwatosa, Wis. 53226
Filed Oct. 20, 1977, Ser. No. 844,072
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—208



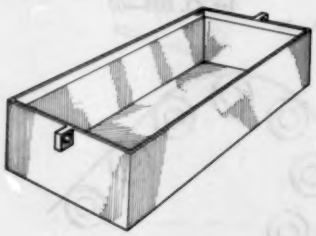
252,713
CHESS BOARD
Gary D. Weiss, R.R. 1 - Box 324-C, Kapaa, Hi. 96746
Filed Dec. 14, 1977, Ser. No. 860,640
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—24

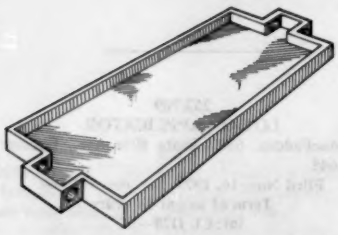


252,714
TOY VEHICLE
Harold D. Tidwell, 510 Rita La., Duncanville, Tex. 75116
Filed Jun. 27, 1977, Ser. No. 810,589
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—78



252,715
SMALL ARMS STORAGE CONTAINER
David M. Cole, 4529 Royal Oak Dr., Roanoke, Va. 24014
Filed Nov. 26, 1976, Ser. No. 745,447
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—78





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TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF AUGUST, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co., Inc.: *See*—
Bennett, J. Richard, 4,164,972, Cl. 160-66.000.

A/S N. Foss Electric: *See*—
Nielsen, Holger; and Salling, Per, 4,165,033, Cl. 235-439.000.

AB IRO: *See*—
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Aberg, Axel K. G.: *See*—
Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Aberg, Axel K. G., 4,165,384, Cl. 424-324.000.

Abraham, William: *See*—
Williams, Frank R.; and Abraham, William, 4,165,141, Cl. 339-75.00R.

Accuratio Systems, Inc.: *See*—
James, James R., 4,165,187, Cl. 366-150.000.

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Adams Brush Manufacturing Co., Inc.: *See*—
Zurawin, Adam; and Ricciuti, Gaetano, 4,164,803, Cl. 15-257.050.

Adams, Harold R. Packing sealer plug. 4,165,080, Cl. 277-72.0FM.

Admiral Corporation: *See*—
Virva, John J., 4,164,988, Cl. 181-156.000.

Aeg-Elotherm, G.m.b.H.: *See*—
Reinke, Friedhelm; and Emde, Friedhelm, 4,165,246, Cl. 148-150.000.

Aerojet-General Corporation: *See*—
Qasim, Javed; and McJones, Robert W., 4,165,063, Cl. 251-168.000.

Affa, Stephen N.; and Yorke, Roy E., to General Connectors Corporation. Flexible ball joint. 4,165,107, Cl. 285-41.000.

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Sorbier, Pierre, 4,165,353, Cl. 264-120.000.

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Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,165,228, Cl. 65-111.000.

Ageo Industries Co., Ltd.: *See*—
Onda, Isao, 4,165,094, Cl. 280-261.000.

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Engelsmann, Dieter; Hackenberg, Hubert; and Schroder, Rolf, 4,165,166, Cl. 354-21.000.

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von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., 4,165,387, Cl. 426-16.000.

Aichelmann, Frederick J., Jr., to International Business Machines Corporation. Bidirectional serial-parallel-serial charge-coupled device. 4,165,539, Cl. 365-183.000.

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Irons, Ronald E., 4,165,497, Cl. 333-101.000.

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Bechara, Ibrahim S.; and Holland, Dewey G., 4,165,412, Cl. 521-121.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Takikawa, Yujiro, 4,164,908, Cl. 112-168.000.

Akao, Akimasa: *See*—
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Akasaka, Shigeo, to Nippon Kogaku K.K. Dial click stop apparatus. 4,165,164, Cl. 354-289.000.

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Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.

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Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Aberg, Axel K. G., 4,165,384, Cl. 424-324.000.

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Schweizer, Udo P., 4,164,839, Cl. 57-293.000.

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Alfes, Franz; Heine, Diez; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, to Bayer Aktiengesellschaft. Chlorination of polyolefins in the presence of complex formers. 4,165,431, Cl. 525-357.000.

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Dummermuth, Ernst; Grudowski, Raymond A.; Grants, Valdis; and Schmidt, Otomar, 4,165,534, Cl. 364-900.000.

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Alley, Lawrence E., III; Lydick, Richard P.; and Stanley, Robert E., to ARCO Medical Products Company. Digital means for non-invasively controlling the parameters of an implantable heart pacer. 4,164,944, Cl. 128-419.0PG.

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Sundie, Richard D.; and Michael, William R., 4,165,305, Cl. 260-29.40R.
Vander Mey, John E., 4,165,294, Cl. 252-143.000.
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Allis-Chalmers Corporation: *See*—
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Allmansberger, Robert A.: *See*—
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Kinosz, Donald L.; Jennings, Charles E.; and Jacobs, Stanley C., 4,165,263, Cl. 204-67.000.

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Lutz, Albert W.; and Diehl, Robert E., 4,165,231, Cl. 71-121.000.
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Summer, James R., 4,165,059, Cl. 244-100.00A.

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Hathaway, Richard A., 4,165,523, Cl. 360-77.000.

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Andabursky, Semen I.: *See*—
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Andersen, Paul R., to Square D Company. Current limiter assembly for a circuit breaker. 4,165,502, Cl. 335-39.000.

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Ikeda, Hiroyuki; Ando, Moritoshi; and Inagaki, Takefumi, 4,165,464, Cl. 250-550.000.

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Lux, Helmut; and Landwehr, Gotz, 4,164,989, Cl. 181-265.000.

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Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.

Aotsuka, Yasuo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,165,236, Cl. 96-74.000.

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Carlsson, Kurt H.; Imberg, Bengt U.; de Ronde, Frans C.; and Appelquist, Jan O., 4,165,454, Cl. 219-10.55F.

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Banning, Jack A.: *See*—
Borenstein, David E.; and Banning, Jack A., 4,164,841, Cl. 57-350.000.

Barber-Greene Company: *See*—
Batch, Joseph, 4,165,044, Cl. 241-264.000.

Barbieri, Siegfried, to Durst AG. Fabrik Fototechnischer Apparate. Apparatus for sampling printing light in a photographic enlarger for determining its color composition. 4,165,175, Cl. 355-38.000.

Bardoneschi, Roland; Jouquey, Alain; and Philibert, Daniel, to Roussel Uclaf. Steroids and their preparation. 4,165,326, Cl. 260-397.500.

Barger, Frank L.: *See*—
Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., 4,165,259, Cl. 196-14.520.

Bartels, Herbert D., to Continental Group, Inc., The. Inward embossed panel adjacent to punched pour hole in top end unit. 4,165,004, Cl. 206-631.000.

Barter, LeRoy D., to Beckman Instruments, Inc. Method and apparatus for detecting a peak value of an analog signal. 4,165,508, Cl. 340-347.0AD.

BASF Aktiengesellschaft: *See*—
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, 4,165,342, Cl. 260-603.00C.
Huber, Walter, 4,165,219, Cl. 23-230.00R.
Jaeckh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.
Strehler, Hugo; Dietl, Ernst; and Pilz, Georg, 4,165,335, Cl. 260-501.200.

BASF Wyandotte Corporation: *See*—
Login, Robert B.; and Newkirk, David D., 4,165,405, Cl. 428-395.000.
Narayan, Thirumurti; Patton, John T., Jr.; Cenker, Moses; and Wulff, Harald P., 4,165,414, Cl. 521-129.000.

Batch, Joseph, to Barber-Greene Company. Jaw crusher having wedges for toggle beam. 4,165,044, Cl. 241-264.000.

Batton, James L. Portable map reading system. 4,164,822, Cl. 40-361.000.

Baudoin, Jean-Claude; and Oger, Robert, to Commissariat a l'Energie Atomique. Gripping apparatus for the tongs of a remote manipulator. 4,165,116, Cl. 294-86.00R.

Bauer, Alfred, to Caracteres S.A. Characters carrying disc for a printing machine. 4,165,189, Cl. 400-144.200.

Bauer, Richard G.; and Rubio, Diego C., to Goodyear Tire & Rubber Company, The. Thermoplastic ionic polymer compositions. 4,165,347, Cl. 525-69.000.

Baum, Kurt: *See*—
Beard, Charles D.; and Baum, Kurt, 4,165,332, Cl. 260-453.00R.

Baumann, Gerald W.; Burdick, Robert L.; Goff, Willie, Jr.; and Libby, Edwin L., to International Business Machines Corporation. Electrophotographic document copier machine with modular paper path assembly. 4,165,168, Cl. 355-3.00R.

Bayer Aktiengesellschaft: *See*—
Alfes, Franz; Heine, Diez; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, 4,165,431, Cl. 525-357.000.
Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kaloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.
Casper, Clemens; Lippert, Axel; and Sajben, Johannes O., 4,165,360, Cl. 422-202.000.
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.

Baylac, Christiane: *See*—
de Panafieu, Arnaud; Villard, Michel; Baylac, Christiane; and Favre, Michel, 4,165,222, Cl. 65-2.000.

Beacham, Bryan; and Sutton, Gordon W., to British Petroleum Company Limited, The. Nozzle. 4,165,040, Cl. 239-600.000.

Beard, Charles D.; and Baum, Kurt, to United States of America, Navy. Preparation of aliphatic perchlorates and of trifluoromethane sulfonates. 4,165,332, Cl. 260-453.00R.

Beard, Michael A.; and Williams, Edward A., to DCA Design Consultants Limited. Face mask and facepiece therefor. 4,164,942, Cl. 128-146.500.

Bechara, Ibrahim S.; and Holland, Dewey G., to Air Products and Chemicals, Inc. Delayed action catalysts for polyurethanes. 4,165,412, Cl. 521-121.000.

Bechtold, Joseph A. Smoking appliance. 4,164,950, Cl. 131-194.000.

Becker, Barry E., to Circuit Technology Incorporated. Bi-state linear amplifier. 4,165,494, Cl. 330-267.000.

Becker, Claus: *See*—
Jurenz, Rolf; and Becker, Claus, 4,165,167, Cl. 354-53.000.

Beckman Instruments, Inc.: *See*—
Barter, LeRoy D., 4,165,508, Cl. 340-347.0AD.

Beckmann, Georg: *See*—
Gilli, Paul V.; and Beckmann, Georg, 4,164,848, Cl. 60-652.000.

Becton, Dickinson and Company: *See*—
Haynes, John L., 4,165,484, Cl. 324-71.0CP.

Begnaud, John D.: *See*—
Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., 4,165,259, Cl. 196-14.520.

Beizer, Ella J.: *See*—
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Belfort, Gerard L. A., to Produits Chimiques Ugine Kuhlmann. Catalyst complex for the preparation of cyano-azo dyestuffs. 4,165,297, Cl. 252-429.00R.

Bell & Howell Company: *See*—
Persha, Thomas J.; Lehto, Eino M.; Dueck, Richard; and Hechimovich, Nick, 4,165,160, Cl. 353-55.000.

Bell Telephone Laboratories, Incorporated: *See*—
Bergman, John G., Jr.; Jain, Ravinder K.; and Wagner, Sigurd, 4,165,515, Cl. 357-6.000.
Blank, Stuart L., 4,165,410, Cl. 428-539.000.
Di Domenico, Mauro, Jr.; Karr, Michael A., III; and Rich, Theodore C., 4,165,496, Cl. 331-94.50S.
Grabau, Edwin W., 4,165,142, Cl. 339-75.00R.

Bennett, J. Richard, to A & E Plastik Pak Co., Inc. Boxed awning assembly. 4,164,972, Cl. 160-66.000.

Bennett, John A.; McAllister, Ian R.; and Welsh, Howard, to Bennett Pollution Controls Ltd. Oil recovery method and apparatus. 4,165,282, Cl. 210-40.000.

Bennett Pollution Controls Ltd.: *See*—
Bennett, John A.; McAllister, Ian R.; and Welsh, Howard, 4,165,282, Cl. 210-40.000.

Bentley, Stanley L.; and Jessup, David G., to Ransburg Corporation. Hand-held coating-dispensing apparatus. 4,165,022, Cl. 222-76.000.

Benzinger, Theodor H. Thermostat system for radiant room heating. 4,164,869, Cl. 73-355.00R.

Berger, Hans-Jurgen; Koch, Ferdinand; Scharf, Rolf; and Schlussler, Hans-Joachim, to Henkel Kommanditgesellschaft auf Aktien. Low-foaming disinfecting agents based on quaternary ammonium compounds. 4,165,375, Cl. 424-263.000.

Bergkvist, Lars A. Electronic measuring tape. 4,164,816, Cl. 33-139.000.

Bergman, John G., Jr.; Jain, Ravinder K.; and Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Light emitting tunnel junctions which are stable at room temperature. 4,165,515, Cl. 357-6.000.

Beringer, Monique; and Sporri, Heinz, to Tamag Basel AG. Method for making artificial tobacco and apparatus for performing said method. 4,164,948, Cl. 131-140.00C.

Bertoglio, Ottavio; De Micheli, Spiridione; and Tiribelli, Paolo, to CSELT — Centro Studi e Laboratori Telecomunicazioni. Centralized data-registration equipment for traffic supervision in telecommunication system. 4,165,447, Cl. 179-7.10R.

Bertone, Giuseppe, to Carrozzeria Bertone S.p.A. Motor vehicle body with a rigid sunshine roof. 4,165,122, Cl. 296-107.000.

Bertozzi, Eugene R., to Thiokol Corporation. Alkyl tin oxide cured polysulfide rubbers in hot melt applications. 4,165,425, Cl. 528-374.000.

Berube, Richard G., to King Instrument Corporation. Reel holding hub assembly. 4,165,050, Cl. 242-68.300.

Besson, Yves: *See*—
Motola, Marcel; and Besson, Yves, 4,165,492, Cl. 328-165.000.

Betts, Donald J.; and Hamilton, Martin W., to Eaton Corporation. Dual liquid level monitor. 4,165,509, Cl. 340-620.000.

Beyler, Roland R. C. Method for reducing pollution due to an internal combustion engine. 4,164,912, Cl. 123-26.000.

Bierlich, Johannes H. Double-glazed doors or windows and frame assemblies therefor. 4,164,830, Cl. 52-398.000.

Biskup, Edward J., to General Motors Corporation. Occupant propelled cambering vehicle. 4,165,093, Cl. 280-220.000.

Black, Thomas C., to J. F. Stevens & Co., Inc. Apparatus for forming a narrow weave from bare elastomeric threads. 4,164,963, Cl. 139-11.000.

Blaha, Gerald E.: *See*—
Gudmestad, Ragnar; and Blaha, Gerald E., 4,164,808, Cl. 29-564.400.

Blakely, Donald W.: *See*—
Blanton, William A., Jr.; and Blakely, Donald W., 4,165,275, Cl. 208-113.000.

Blank, Stuart L., to Bell Telephone Laboratories, Incorporated. Magnetic bubble devices with controlled temperature characteristics. 4,165,410, Cl. 428-539.000.

Blanton, William A., Jr.; and Blakely, Donald W., to Chevron Research Company. Lowering sulfur oxide output from catalyst regeneration. 4,165,275, Cl. 208-113.000.

Bobard, Charles E., to ETS. Bobard Jeune S.A. Straddling tractors. 4,164,985, Cl. 180-53.00D.

Bodart, Ronald A., to Little Gem Manufacturing, Inc. Combination log saw and splitter machine. 4,164,965, Cl. 144-3.00K.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Witte, Wolfgang W. F., 4,165,181, Cl. 356-319.000.

Bodmer, Jerome R., to NCR Corporation. Method of preparing zinc-modified phenol-aldehyde novolak resins and use as a color-developer. 4,165,102, Cl. 282-27.500.

Bodmer, Jerome R., to NCR Corporation. Method of preparing zinc-modified phenol-aldehyde novolak resins and use as a color-developing agent. 4,165,103, Cl. 282-27.500.

Boeing Company, The: *See*—
Whitener, Philip C., 4,165,058, Cl. 244-45.00R.

Boeing Wichita Company: *See*—
Cassatt, Gary G.; and Miller, Richard J., 4,164,874, Cl. 73-799.000.

Bongort, Edgar A.; and Cruickshank, William T., to B/W Controls Inc. Position sensing system. 4,165,501, Cl. 335-206.000.

Bonser, Norman L. Mechanical target. 4,165,074, Cl. 273-105.600.

Borenstein, David E.; and Banning, Jack A., to Phillips Petroleum Company. Method and apparatus for continuous formation of bulked and entangled multifilament yarn. 4,164,841, Cl. 57-350.000.

Borisovsky, Igor V.: *See*—
Azarov, Nikolai N.; Zelensky, Georgy A.; and Borisovsky, Igor V., 4,165,273, Cl. 204-301.000.

Bornmann, Hans: *See*—
Linden, Heinrich; and Bornmann, Hans, 4,165,239, Cl. 106-300.000.

Borst, Adolf H. System for the clarification of waste water and utilization of waste products. 4,165,289, Cl. 210-27.000.

Bottcher, Wolfgang; and Kopineck, Hermann-Josef, to Hoesch Werke Aktiengesellschaft. Method of and device for material checking by ultra sound while employing an electrodynamic sound converter. 4,164,873, Cl. 73-643.000.

Bottum, Edward W. Heat exchanger holder. 4,164,975, Cl. 165-68.000.

Boudreau, Robert J.; and Cunard, Joel C., to Hedstrom Co. Stroller canopy. 4,165,097, Cl. 280-647.000.

Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, to L'Oreal. (2-Oxo-3-bornylidene methyl)-benzene sulfonates and derivatives thereof. 4,165,336, Cl. 260-511.000.

Bouza, Gordon F. Shotgun wad for use as a practice projectile. 4,164,903, Cl. 102-41.000.

Bowden, James J. Lime removal from furnace surfaces. 4,165,065, Cl. 266-44.000.

Bowen, William E., to American Can Company. Radiation monitors and method for positioning. 4,165,463, Cl. 250-372.000.

Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., to Glaxo Laboratories Limited. Cephalosporins having a 7-carboxy substituted α-etherified oximinoarylacetamido) group. 4,165,430, Cl. 544-22.000.

Brands, Antoon H.; and Gietema, Jouke, to Hollandse Signaalapparaten B.V. Control unit for the brightness of video signals on a raster scan display. 4,165,506, Cl. 340-706.000.

Breuers, Konrad K. Screwdriver. 4,164,967, Cl. 145-50.00A.

Brew, William R.; and Price, Raymond M., to United States of America, Navy. Polyurethane solid propellant binder. 4,165,247, Cl. 149-19.400.

Bricker, Lyle J.: *See*—
Tortorich, David J.; Bricker, Lyle J.; and Yasenak, John P., 4,165,186, Cl. 366-142.000.

Briggs, Robert W. Ski and ski pole assembly. 4,165,027, Cl. 224-45.00S.

Brinkman, Willem, to Holec N.V. Device for supplying fuel to a combustion engine and method of manufacturing said device. 4,164,920, Cl. 123-139.00R.

British Petroleum Company Limited, The: *See*—
Beacham, Bryan; and Sutton, Gordon W., 4,165,040, Cl. 239-600.000.
du Chaffaut, Jean A.; Magnoux, Claude R.; and Oberto, Patrick L. C., 4,165,389, Cl. 426-42.000.

British Steel Corporation: *See*—
Hardwick, Kenneth G.; and Bagshaw, Trevor, 4,164,973, Cl. 164-52.000.

Brodt, Rudolf: *See*—
Jaeckh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.

Brosow, Jorgen, to Dasy Inter S.A. Circuit for preventing acoustic feedback. 4,165,445, Cl. 179-1.0HF.

Brown, Douglas S., to Carrier Corporation. Apparatus for securing removable containers to vehicle platforms. 4,165,007, Cl. 414-494.000.

Broxholm, Anne K., administratrix: *See*—
Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,889, Cl. 89-7.000.
Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,890, Cl. 89-185.000.

Broxholm, Thomas M., deceased: *See*—
Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,889, Cl. 89-7.000.
Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,890, Cl. 89-185.000.

Brunnmueller, Fritz: *See*—
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, 4,165,342, Cl. 260-603.00C.

Brusa, Ugo. Apparatus for grouping into bundles elongated objects, more particularly sections or flat rolled elements. 4,165,006, Cl. 414-63.000.

Brush, Charles K.; and Weinstock, Joseph, to SmithKline Corporation. 6-Carboxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine compounds and use as dopaminergic agents. 4,165,372, Cl. 424-244.000.

Bryant, Jon A. Beverage container cooler. 4,164,851, Cl. 62-381.000.

Buck, Josef J., to Magnetic Controls Company. Printed circuit board jack. 4,165,147, Cl. 339-182.00R.

Bugajski, Frank H.; and Patel, Jitendra G., to Inland Steel Company. Pipeline charging of coal into coke oven. 4,165,260, Cl. 201-40.000.

Bundy, Gordon L., to Upjohn Company, The. Trans-2,3-didehydro-9-deoxy-9-methylene-PGF compounds. 4,165,436, Cl. 560-121.000.

Bunger, Arthur W.; and Kitchell, Thorne C., to Union Camp Corporation. Two cell bulk box. 4,165,030, Cl. 229-15.000.

Bunker Ramo Corporation: *See—*
Dragisic, Joseph, 4,164,812, Cl. 29-749.000.

Burdick, Robert L.: *See—*
Baumann, Gerald W.; Burdick, Robert L.; Goff, Willie, Jr.; and Libby, Edwin L., 4,165,168, Cl. 355-3.00R.

Burgess, Glenn A.; and Yamanaka, Clarence T., to Garrett Corporation, The. Excessive rate detection system. 4,164,898, Cl. 98-1.500.

Burgess, Glenn A., to Garrett Corporation, The. Pressure differential system. 4,164,899, Cl. 98-1.500.

Burgess, Glenn A.: *See—*
Aldrich, Howard P.; Burgess, Glenn A.; and Yamanaka, Clarence T., 4,164,895, Cl. 98-1.500.
Aldrich, Howard P.; Yamanaka, Clarence T.; and Burgess, Glenn A., 4,164,897, Cl. 98-1.500.

Burke, Zane L., to Davis Walker Corporation. Recovery of suspended particulate metal from quench water. 4,165,401, Cl. 427-398.00B.

Burroughs Corporation: *See—*
Gibbs, Stephen R., 4,165,252, Cl. 156-655.000.
Krause, Peter L., 4,165,531, Cl. 364-200.000.
Layton, Wilbur T.; and Schwartz, Sidney J., 4,165,536, Cl. 365-2.000.

Butler, Walter J.; and Eichelberger, Charles W., to General Electric Company. Reference voltage source with temperature-stable MOSFET amplifier. 4,165,478, Cl. 323-19.000.

Cain, Charles J.; and Shankle, Arthur T. Apparatus for remotely determining the angular orientation, speed, and/or direction of rotation of objects. 4,165,505, Cl. 340-200.000.

Calamari, James A., Jr., to RCA Corporation. Method for salvaging the light-absorbing matrix and support of a luminescent screen. 4,165,396, Cl. 427-64.000.

California Injection Molding Co., Inc.: *See—*
Mitchell, John G., 4,165,062, Cl. 249-141.000.

Calistrat, Michael M., to Koppers Company, Inc. Segmented driving shaft. 4,164,855, Cl. 64-2.00P.

Campbell, Paul K.; and Nichols, Edward L., III, to Square D Company. Compressible electrical connector with positive mechanical lock. 4,165,148, Cl. 339-276.00R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Laviolette, Maurice A., 4,164,904, Cl. 102-92.700.

Canadian Instrumentation and Research Limited: *See—*
Failes, Michael, 4,165,180, Cl. 356-310.000.

Canon Kabushiki Kaisha: *See—*
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.
Momiyama, Kikuo, 4,165,151, Cl. 350-201.000.
Suzki, Akiyoshi; and Hirabayashi, Yoichi, 4,165,149, Cl. 350-6.100.

Caracteres S.A.: *See—*
Bauer, Alfred, 4,165,189, Cl. 400-144.200.

Carl Schenck AG, Firma: *See—*
Dodt, Hans-Walter; and Kraft, Dieter, 4,164,994, Cl. 188-296.000.

Carlson, John D.: *See—*
Sefton, Robert H.; and Carlson, John D., 4,165,413, Cl. 521-128.000.

Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Aberg, Axel K. G., to Aktiebolaget Hassle. Amide substituted phenoxy propanol amines. 4,165,384, Cl. 424-324.000.

Carlsson, Kurt H.; Imberg, Bengt U.; de Ronde, Frans C.; and Appelquist, Jan O., to U.S. Philips Corporation. Microwave oven. 4,165,454, Cl. 219-10.55F.

Carrier Corporation: *See—*
Brown, Douglas S., 4,165,007, Cl. 414-494.000.

Carrozzeria Bertone S.p.A.: *See—*
Bertone, Giuseppe, 4,165,122, Cl. 296-107.000.

Cascade Corporation: *See—*
Faust, Donald M.; and Weinert, Harry F., 4,165,008, Cl. 414-750.000.

Casper, Clemens; Lippert, Axel; and Sajben, Johannes O., to Bayer Aktiengesellschaft. Multi-phase flow tube for mixing, reacting and evaporating components. 4,165,360, Cl. 422-202.000.

Cassatt, Gary G.; and Miller, Richard J., to Boeing Wichita Company. Flaw growth correlator. 4,164,874, Cl. 73-799.000.

Casse, Christian, to Paulstra. Multicellular elastomeric shock-absorbing device. 4,165,113, Cl. 293-121.000.

Castle, Peter M., to Westinghouse Electric Corp. Method of making halogenated acetylenes. 4,165,269, Cl. 204-163.00R.

Castleton, Albert E.: *See—*
Dickson, Stanley J.; and Castleton, Albert E., 4,165,191, Cl. 400-636.000.

Caterpillar Tractor Co.: *See—*
Congram, Sam R.; and Cole, George S., 4,164,927, Cl. 123-195.00C.
Goloff, Alexander, 4,164,957, Cl. 137-340.000.
Stedman, Robert N., 4,165,137, Cl. 305-54.000.

Cato Oil and Grease Co.: *See—*
Oswalt, Leon M.; and McClanahan, Jimmie D., 4,165,024, Cl. 222-105.000.

Cavitron Corporation: *See—*
Ragsdale, Charles W., 4,164,863, Cl. 128-652.000.

Cella, Richard T. Golf putter. 4,165,076, Cl. 273-168.000.

Cenker, Moses: *See—*
Narayan, Thirumurti; Patton, John T., Jr.; Cenker, Moses; and Wulff, Harald P., 4,165,414, Cl. 521-129.000.

Central Glass Company Limited: *See—*
Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,165,228, Cl. 65-111.000.

Centro Sperimentale Metallurgico S.p.A.: *See—*
Colletta, Angelo; and Marini, Paolo, 4,165,220, Cl. 44-23.000.

Chadwick, Daniel E. Snowboard. 4,165,091, Cl. 280-12.00H.

Chakrabarti, Paritosh M., to GAF Corporation. Hair preparations containing vinyl pyrrolidone copolymer. 4,165,367, Cl. 424-47.000.

Chandalia, Kiran B.: *See—*
Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,165,432, Cl. 536-4.000.

Chang, Tai Hon P., to International Business Machines Corporation. Process for forming a high aspect ratio structure by successive exposures with electron beam and actinic radiation. 4,165,395, Cl. 427-43.000.

Chevron Research Company: *See—*
Blanton, William A., Jr.; and Blakely, Donald W., 4,165,275, Cl. 208-113.000.
Dreher, John L.; and Stanton, Garth M., 4,165,329, Cl. 260-404.500.
Reynolds, Richard N., Jr., 4,165,322, Cl. 260-343.600.
Schneider, Ronald A., 4,165,438, Cl. 560-211.000.

Chilpan, Kurt C.; and Lewis, William L., to Roberts Company. Method and apparatus for twisting yarns. 4,164,840, Cl. 57-313.000.

Chivari, Ilie. Coupling for the vibration-damping transmission of torques. 4,164,877, Cl. 74-574.000.

Chiyoda Chemical Engineering and Construction Company Ltd.: *See—*
Nakamura, Rinjiro, 4,165,348, Cl. 261-36.00A.

Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing sulfinyl chlorides from penicillin sulfoxides. 4,165,316, Cl. 260-239.00A.

Christensen, George L. Junior stirrups attachment for adult-size saddle. 4,164,834, Cl. 54-46.000.

Chrysler Corporation: *See—*
Wagner, David A., 4,165,098, Cl. 280-708.000.
Wagner, David A.; Doran, Daniel W.; and Emenaker, Robert C., 4,165,099, Cl. 280-708.000.

Chung, Jing-yau: *See—*
Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, 4,164,867, Cl. 73-346.000.

Ciba-Geigy AG: *See—*
Marti, Franz; Somlo, Tibor; and Gosteli, Jacques, 4,165,268, Cl. 204-163.00R.

Ciba-Geigy Corporation: *See—*
Hiestand, Armin; and Rohringer, Peter, 4,165,435, Cl. 544-197.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,165,381, Cl. 424-309.000.
von der Crone, Jost; and Frey, Christoph, 4,165,319, Cl. 260-325.0PH.

Circle F Industries, Inc.: *See—*
Snyder, Charles A., 4,165,146, Cl. 339-128.000.

Circuit Technology Incorporated: *See—*
Becker, Barry E., 4,165,494, Cl. 330-267.000.

Cities Service Company: *See—*
Armenti, Carmen F.; and De Juneas, James V., 4,165,302, Cl. 260-8.000.

Cities Service Conmpany: *See—*
Levine, Ralph; and Olechowski, Jerome R., 4,165,343, Cl. 585-638.000.

Citizen Watch Co., Ltd.: *See—*
Ebihara, Heihachiro, 4,164,842, Cl. 58-23.00A.

Clark Equipment Company: *See—*
Peppel, Jon H., 4,164,876, Cl. 74-336.00R.

Clegg, Russell B.: *See—*
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,164,810, Cl. 29-568.000.

Clements, John A., to General Motors Corporation. Fluid seal ring. 4,165,079, Cl. 277-9.500.

Cleveland, Andrew J.: *See—*
Wessler, Louis E.; Koch, Kenneth F.; and Cleveland, Andrew J., 4,165,520, Cl. 358-280.000.

Cobb, Bernie J.: *See—*
Looger, Lonnie L.; and Cobb, Bernie J., 4,164,888, Cl. 89-1.814.

Cobe Laboratories, Inc.: *See—*
Goyne, Thomas E., 4,165,287, Cl. 210-232.000.

Cole, Charles F.; and Elenburg, Jimmie H., to Continental Oil Company. Push drill guidance indication apparatus. 4,164,871, Cl. 73-432.00R.

Cole, George S.: *See—*
Congram, Sam R.; and Cole, George S., 4,164,927, Cl. 123-195.00C.

Cole, Rossa W.: *See—*
Moskowitz, Seymour; and Cole, Rossa W., 4,164,846, Cl. 60-39.46S.

Coleman Company, Inc., The: *See—*
Liepins, Sigurds; and Crane, James W., 4,164,929, Cl. 124-76.000.

Colgate Palmolive Company: *See—*
Gaffar, Maria C., 4,165,368, Cl. 424-52.000.
Mellberg, James R., 4,165,366, Cl. 424-49.000.

Colglazier, Donald F.; Kollar, Ernest P.; and Mares, Fred R., to International Business Machines Corporation. Copier having removable paper feed module. 4,165,069, Cl. 271-162.000.

Colletta, Angelo; and Marini, Paolo, to Centro Sperimentale Metallurgico S.p.A. Process for producing hardened semicoke briquettes. 4,165,220, Cl. 44-23.000.

Collins, Cecil A., to Fisher Corporation. Comfort lock mechanism. 4,165,054, Cl. 242-107.700.

Commissariat a l'Energie Atomique: *See—*
Baudoin, Jean-Claude; and Oger, Robert, 4,165,116, Cl. 294-86.00R.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous Marines "C.G. Doris": *See—*
Serrano, Francisco de Assis M., 4,165,196, Cl. 405-205.000.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See—*
Vinot, Daniel, 4,165,540, Cl. 365-190.000.

Comte, Pierre, to Ebauches S.A. Instrument intended to be carried at the wrist. 4,165,477, Cl. 320-61.000.

Conax Corporation: *See—*
Naab, Carlton W.; and Jankowiak, Roman, 4,164,953, Cl. 137-72.000.

Concrete Industries (Monier) Limited: *See—*
Tomlinson, Robert K., 4,164,996, Cl. 198-415.000.

Condon, Michael E.: *See—*
Ondetti, Miguel A.; and Condon, Michael E., 4,165,320, Cl. 260-326.12R.

Congram, Sam R.; and Cole, George S., to Caterpillar Tractor Co. Reinforced stamped valve cover. 4,164,927, Cl. 123-195.00C.

Consolidated Medical Equipment Inc.: *See—*
Williams, Frank R.; and Abraham, William, 4,165,141, Cl. 339-75.00R.

Conte, Joseph. Grass cutter. 4,164,835, Cl. 56-291.000.

Continental Group, Inc., The: *See—*
Bartels, Herbert D., 4,165,004, Cl. 206-631.000.
Giggard, Earl D., 4,165,018, Cl. 220-284.000.
Hasegawa, Gary K., 4,165,015, Cl. 220-269.000.
Hasegawa, Gary K., 4,165,017, Cl. 220-273.000.
Holk, Albert J., Jr., 4,165,011, Cl. 220-67.000.
Mascia, Carmen T.; and Hawegawa, Gary K., 4,165,025, Cl. 222-401.000.
Moller, Jens L., 4,165,016, Cl. 220-270.000.
Payne, Robert D., 4,165,134, Cl. 406-1.000.

Continental Oil Company: *See—*
Cole, Charles F.; and Elenburg, Jimmie H., 4,164,871, Cl. 73-432.00R.
Stokke, Olaf M., 4,165,257, Cl. 435-262.000.

Control Systems Limited: *See—*
Dickson, Stanley J.; and Castleton, Albert E., 4,165,191, Cl. 400-636.000.

Cook, Albert N.; Kornatowski, Boleslaw; and Tyburcy, Raymond S., to Singer Company, The. Light socket with lever contacts. 4,165,144, Cl. 339-88.00R.

Cook, Martin C.: *See—*
Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., 4,165,430, Cl. 544-22.000.

Cooper, Thomas F. Bonded stacked snap rings. 4,165,001, Cl. 206-343.000.

Corbett, Herbert O., to National Distillers and Chemical Corporation. Laminated products, and methods and apparatus for producing the same. 4,165,210, Cl. 425-133.500.

Corbett nee Rolison, Constance R., to Stauffer Chemical Company. Agent for providing meaty flavor in foods. 4,165,391, Cl. 426-580.000.

Corderman, Roy C. Low power system and method for communicating audio information to patrons having portable radio receivers. 4,165,487, Cl. 325-54.000.

Corning Glass Works: *See—*
Powers, Dale R., 4,165,223, Cl. 65-2.000.

Coumo, Salvatore R., Jr.; and Ellington, Thomas M., Jr., to International Business Machines Corporation. Gap measurement tool. 4,165,178, Cl. 356-1.000.

Coval, Myer Louis. Injectable gamma globulin. 4,165,370, Cl. 424-85.000.

CPC International Inc.: *See—*
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sumiko, 4,165,240, Cl. 127-29.000.

Crane, James W.: *See—*
Liepins, Sigurds; and Crane, James W., 4,164,929, Cl. 124-76.000.

Crouch, Charles E.: *See—*
United States of America, National Aeronautics and Space Administration; Rose, Stephen D.; Crouch, Charles E.; and Jones, Elborn W., 4,165,460, Cl. 250-253.000.

Cruickshank, William T.: *See—*
Bongort, Edgar A.; and Cruickshank, William T., 4,165,501, Cl. 335-206.000.

CSELT — Centro Studi e Laboratori Telecomunicazioni: *See—*
Bertoglio, Ottavio; De Micheli, Spiridione; and Tiribelli, Paolo, 4,165,447, Cl. 179-7.10R.

Cummins Engine Company, Inc.: *See—*
Glasson, Richard E., 4,164,917, Cl. 123-97.00B.

Cunard, Joel C.: *See—*
Boudreau, Robert J.; and Cunard, Joel C., 4,165,097, Cl. 280-647.000.

Cunningham, Hugh, to PPG Industries, Inc. Hollow cathode for an electrolytic cell. 4,165,272, Cl. 204-282.000.

Curtice, Walter R., to RCA Corporation. Time interval measurement. 4,165,459, Cl. 235-92.0TF.

Curtiss-Wright Corporation: *See—*
Moskowitz, Seymour; and Cole, Rossa W., 4,164,846, Cl. 60-39.46S.

Dai Nippon Ink & Chemicals Incorporated: *See—*
Mizuno, Shioji; and Sugie, Toshinori, 4,165,307, Cl. 260-40.0TN.

Dai Nippon Toyo Co. Ltd.: *See—*
Tugukuni, Hideyoshi; and Kano, Masafumi, 4,165,406, Cl. 428-407.000.

Daikin Kogyo Co., Ltd.: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.
Tohzuka, Takashi; and Ohsaka, Yohnosuke, 4,165,340, Cl. 260-593.00H.

Daly, William T.: *See—*
Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.

Dana Corporation: *See—*
Klingenberg, James C., 4,165,032, Cl. 233-23.00R.

Daniels, Paul J., to Alderman, Shirley D.; and Hendrix, Joyce D., part interest to each. Fluid dispenser for reconstituting beverages and the like. 4,164,964, Cl. 141-329.000.

Dantzig, Jonathan A.; and Tyler, Derek E., to Swiss Aluminium Ltd. Method for inline degassing and filtration of molten metal. 4,165,235, Cl. 75-93.00E.

Darch, Doyle: *See—*
Urdea, Myron G.; Darch, Doyle; and Urdea, John N., 4,165,089, Cl. 280-87.04A.

Darlington, William B.; Driskill, John D.; and Du Bois, Donald W., to PPG Industries, Inc. Method of joining fluorocarbon membrane sheets with quaternary ammonium compounds. 4,165,248, Cl. 156-308.000.

Dasy Inter S.A.: *See—*
Brosow, Jorgen, 4,165,445, Cl. 179-1.0HF.

Davis, Bryan T.; and Moat, Nicholas W., to Edwin Cooper and Company Limited. Lubricant corrosion inhibitor. 4,165,292, Cl. 252-51.50A.

Davis, Kenneth G., to Mobil Oil Corporation. Water-based coating composition containing polyvinyl chloride. 4,165,304, Cl. 260-22.0CB.

Davis, Lewis K.; and Lowin, Kenneth J., to Deere & Company. Tank vent system. 4,164,919, Cl. 123-136.000.

Davis Walker Corporation: *See—*
Burke, Zane L., 4,165,401, Cl. 427-398.00B.

Davy-Loewy Limited: *See—*
Holmes, Gordon D., 4,164,858, Cl. 72-237.000.

Dayco Corporation: *See—*
Stikkers, Tieme C., 4,165,466, Cl. 290-3.000.

DCA Design Consultants Limited: *See—*
Beard, Michael A.; and Williams, Edward A., 4,164,942, Cl. 128-146.500.

De Forenede Bryggerier A/S: *See—*
von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., 4,165,387, Cl. 426-16.000.

Deaton, Thomas M.: *See—*
Arendt, Henry P.; Deaton, Thomas M.; and Dooley, Donald L., 4,164,977, Cl. 166-125.000.

Dee, Rudolf, to Hacoba Textilmaschinen GmbH & Co. KG, Firma. Bobbin with snap ring. 4,165,055, Cl. 242-125.200.

Deere & Company: *See—*
Davis, Lewis K.; and Lowin, Kenneth J., 4,164,919, Cl. 123-136.000.
Hoch, John J., 4,164,983, Cl. 172-43.000.
Wilson, John E., 4,164,947, Cl. 130-27.0HA.

DeGood, David A.; and Stevens, David K., to DeGood, David A. Accumulation live roller conveyor. 4,164,998, Cl. 198-781.000.

De Juneas, James V.: *See—*
Armenti, Carmen F.; and De Juneas, James V., 4,165,302, Cl. 260-8.000.

Delbar Products, Inc.: *See—*
O'Connell, Lawrence E., 4,165,156, Cl. 350-307.000.

Dell, Christopher C., to National Research Development Corporation. Froth flotation. 4,165,279, Cl. 209-169.000.

DeMarco, JoAnn, to Loctite Corporation. Self-emulsifying anaerobic composition. 4,165,400, Cl. 427-295.000.

De Micheli, Spiridione: *See—*
Bertoglio, Ottavio; De Micheli, Spiridione; and Tiribelli, Paolo, 4,165,447, Cl. 179-7.10R.

de Panafieu, Arnaud; Villard, Michel; Baylac, Christiane; and Favre, Michel, to Thomson-CSF. Process for the manufacture of optical fibers with a radial refractive index. 4,165,222, Cl. 65-2.000.

de Ronde, Frans C.: *See—*
Carlsson, Kurt H.; Imberg, Bengt U.; de Ronde, Frans C.; and Appelquist, Jan O., 4,165,454, Cl. 219-10.55F.

de Saint-Palais, Jacques, to Societe Nationale Elf Aquitaine (Production). Device for connecting tubes having a small cross-section perpendicularly to a universal coupling element. 4,165,108, Cl. 285-45.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, 4,165,363, Cl. 423-342.000.

Devillard, Roger, to Heurtey Metallurgie. Paint drying oven. 4,164,819, Cl. 34-72.000.

de Vletter, Robbert: *See—*
Wind, Evert; and de Vletter, Robbert, 4,165,285, Cl. 210-195.300.

Diafloc Co., Ltd.: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.

Diakinetics, Incorporated: *See—*
Vago, Robert E., 4,165,127, Cl. 297-345.000.

Dianis Creations, Inc.: *See*—
Lefebvre, Elsa G., 4,165,385, Cl. 424-365.000.

Dick, Perry J., Jr., to Trumbull Corporation. Process and apparatus for applying and compacting castable material in strips on a sloped surface. 4,165,199, Cl. 405-271.000.

Dickson, Stanley J.; and Castleton, Albert E., to Control Systems Limited. Web feed, web cutting and ribbon feed means for a stationery mosaic printer. 4,165,191, Cl. 400-636.000.

Di Domenico, Mauro, Jr.; Karr, Michael A., III; and Rich, Theodore C., to Bell Telephone Laboratories, Incorporated. Optical fiber light tap. 4,165,496, Cl. 331-94.50S.

Diehl, Robert E.: *See*—
Lutz, Albert W.; and Diehl, Robert E., 4,165,231, Cl. 71-121.000.

Diehm, Hans: *See*—
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, 4,165,342, Cl. 260-603.00C.

Dien, Sam. Golf club head covers improvement. 4,164,969, Cl. 150-1.50R.

Dietl, Ernst: *See*—
Strehler, Hugo; Dietl, Ernst; and Pilz, Georg, 4,165,335, Cl. 260-501.200.

Di Marcello, Richard A.: *See*—
Figart, Earl C.; Kelly, J. Kevin; and Di Marcello, Richard A., 4,165,443, Cl. 174-53.000.

Di Marco, Joel E. Tool holder cartridge for chucking lathes. 4,164,880, Cl. 82-36.00R.

Dittert, Karl; and Hartkorn, Hans W., to Ritterwerk GmbH. Electrically powered knife. 4,164,813, Cl. 30-272.00A.

Diven, Jeffrey K., to McCall Associates, Inc. Ash trap for a bong. 4,164,949, Cl. 131-173.000.

Dochnahl, Johann, to Draftex Development AG. Arrangements for retaining and sealing window glass. 4,165,083, Cl. 277-184.000.

Dodt, Hans-Walter; and Kraft, Dieter, to Carl Schenck AG, Firma. Hydraulic eddy brake. 4,164,994, Cl. 188-296.000.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Device for heating to consumption temperature a liquid commestible product sealed in a disposable container. 4,165,456, Cl. 219-449.000.

Doherty, Thomas E., to Owens-Illinois, Inc. Method for controlling a web of material. 4,165,028, Cl. 226-4.000.

Dolhyj, Serge R.; and Milberger, Ernest C., to Standard Oil Company, The. Oxidation catalysts. 4,165,300, Cl. 252-462.000.

Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased (by Ruble, Eulalia Berry, executrix), to Sid Richardson Carbon & Gasoline Co. Carbon black reactor with axial flow burner. 4,165,364, Cl. 423-456.000.

Donohue, James M.; and Mueller, Daniel L., to Xerox Corporation. Control system. 4,165,170, Cl. 355-14.000.

Dooley, Donald L.: *See*—
Arendt, Henry P.; Deaton, Thomas M.; and Dooley, Donald L., 4,164,977, Cl. 166-125.000.

Doran, Daniel W.: *See*—
Wagner, David A.; Doran, Daniel W.; and Emenaker, Robert C., 4,165,099, Cl. 280-708.000.

Dorling, Rolf, to L. & C. Steinmuller GmbH. Hot or cold operating cast pressure container. 4,165,021, Cl. 220-468.000.

Dottore, Nicholas J., Jr. Damper. 4,164,936, Cl. 126-285.00R.

Dow Chemical Company, The: *See*—
Juckniess, Paul R.; and Johnson, David R., 4,165,262, Cl. 204-64.00T.

Downing, Leo G.: *See*—
Kendall, Thomas L.; Downing, Leo G.; and Ray, James A., 4,165,532, Cl. 364-420.000.

Doya, Masaharu: *See*—
Yoshinaka, Shigeo; Doya, Masaharu; Uchiyama, Seiji; and Nozaki, Sadao, 4,165,337, Cl. 260-544.00D.

Drader, Clarence H. Stackable and nestable containers. 4,165,003, Cl. 206-506.000.

Draftex Development AG: *See*—
Dochnahl, Johann, 4,165,083, Cl. 277-184.000.

Dragisic, Joseph, to Bunker Ramo Corporation. Termination tool for assembling electrical cables to connectors. 4,164,812, Cl. 29-749.000.

Draney, Robert G., to J. I. Case Company. Vibratory cable plow assembly. 4,164,982, Cl. 172-40.000.

Dreher, John L.; and Stanton, Garth M., to Chevron Research Company. Grease thickening agent. 4,165,329, Cl. 260-404.500.

Driskill, John D.: *See*—
Darlington, William B.; Driskill, John D.; and Du Bois, Donald W., 4,165,248, Cl. 156-308.000.

Druyvesteyn, Willem F.: *See*—
Koel, Gerrit J.; and Druyvesteyn, Willem F., 4,165,525, Cl. 360-125.000.

Drzewiecki, Tadeusz M.; and Manion, Francis M., to United States of America, Army. Fluidic pressure/flow regulator. 4,164,961, Cl. 137-823.000.

Du Bois, Donald W.: *See*—
Darlington, William B.; Driskill, John D.; and Du Bois, Donald W., 4,165,248, Cl. 156-308.000.

Dubs, Walter; and Preiss, Georg, to Kistler Instrumente AG. Chip-removing machining method and apparatus for semiconducting crystals, specifically suited for the production of force and pressure measuring cells. 4,165,402, Cl. 428-64.000.

du Chaffaut, Jean A.; Magnoux, Claude R.; and Oberto, Patrick L. C., to British Petroleum Company Limited, The. Fermentation process for the production of a protein rich animal feedstuff from liquid dairy by-products. 4,165,389, Cl. 426-42.000.

Duck, Gary S.; and King, Frederick D., to Northern Telecom Limited. Low loss directional coupling for optical fibres. 4,165,150, Cl. 350-96.150.

Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, to BASF Aktiengesellschaft. Preparation of 3-alkyl-buten-1-als. 4,165,342, Cl. 260-603.00C.

Dueck, Richard: *See*—
Persha, Thomas J.; Lehto, Eino M.; Dueck, Richard; and Hechimovich, Nick, 4,165,160, Cl. 353-55.000.

Duke, John A. Well cementing method and apparatus. 4,164,980, Cl. 166-291.000.

Dummermuth, Ernst; Grudowski, Raymond A.; Grants, Valdis; and Schmidt, Otomar, to Allen-Bradley Company. Digital control system with Boolean processor. 4,165,534, Cl. 364-900.000.

Du Pont de Nemours, E. I., and Company: *See*—
Quehl, Henry E., 4,165,404, Cl. 428-212.000.

Dupont, John A.: *See*—
Greenfield, Stanley A.; and Dupont, John A., 4,165,318, Cl. 260-302.00A.

Durst AG. Fabrik Fototechnischer Apparate: *See*—
Barbieri, Siegfried, 4,165,175, Cl. 355-38.000.

E. R. Squibb & Sons, Inc.: *See*—
Ondetti, Miguel A.; and Condon, Michael E., 4,165,320, Cl. 260-326.12R.

Early California Industries Inc.: *See*—
Howard, Charles W., 4,164,960, Cl. 137-604.000.

Eastman Kodak Company: *See*—
Ahrenkeil, Richard K., 4,165,471, Cl. 307-311.000.
Anderson, Richard B.; Hoffmeister, Elaine H.; and Landholm, Richard A., 4,165,238, Cl. 96-119.00R.

Eaton Corporation: *See*—
Betts, Donald J.; and Hamilton, Martin W., 4,165,509, Cl. 340-620.000.
Maltby, Edgar W., 4,165,035, Cl. 236-86.000.

Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, to Agency of Industrial Science and Technology; and Central Glass Company Limited. Process and apparatus for heat treating edge of plate glass. 4,165,228, Cl. 65-111.000.

Ebauches S.A.: *See*—
Comte, Pierre, 4,165,477, Cl. 320-61.000.
Ehrbar, Jean-Paul; and Ganguillet, Claude, 4,165,394, Cl. 427-40.000.

Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, to Bayer Aktiengesellschaft. Apparatus for applying a layer of a liquid foamable reaction mixture to a continuously moving support. 4,165,211, Cl. 425-224.000.

Ebihara, Heihachiro, to Citizen Watch Co., Ltd. Buffer amplifier circuit. 4,164,842, Cl. 58-23.00A.

Echlin Manufacturing Company, The: *See*—
Kindlmann, Peter J., 4,164,926, Cl. 123-148.00E.

Eckell, Wolfgang: *See*—
Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, 4,164,925, Cl. 123-140.00R.

Eckhardt, Wolfgang: *See*—
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,165,381, Cl. 424-309.000.

Edwin Cooper and Company Limited: *See*—
Davis, Bryan T.; and Moat, Nicholas W., 4,165,292, Cl. 252-51.50A.

Eheim, Franz; and Hofer, Gerald, to Robert Bosch GmbH. Timing control system affording maintenance of fuel quanity delivered. 4,164,922, Cl. 123-139.0AQ.

Eheim, Franz: *See*—
Hofer, Gerald; and Eheim, Franz, 4,164,921, Cl. 123-139.0AF.

Ehrbar, Jean-Paul; and Ganguillet, Claude, to Ebauches S.A. Method of preparation of a substrate made of plastic material for its subsequent metallization. 4,165,394, Cl. 427-40.000.

Eichelberger, Charles W.: *See*—
Butler, Walter J.; and Eichelberger, Charles W., 4,165,478, Cl. 323-19.000.

Eiermann, Dankwart, to Wankel GmbH. External axle rotary piston machine. 4,165,209, Cl. 418-190.000.

Einstein, Irving, to Astor, Ruth; and Goldberg, Estelle. Note pad supports for desk telephones. 4,165,451, Cl. 179-178.000.

Electric Power Research Institute, Inc.: *See*—
Paice, Derek A., 4,165,527, Cl. 361-113.000.
Temple, Victor A. K.; and Baliga, B. Jayant, 4,165,517, Cl. 357-38.000.

Electricity Council, The: *See*—
Gale, Philip F., 4,165,482, Cl. 324-52.000.

Elenburg, Jimmie H.: *See*—
Cole, Charles F.; and Elenburg, Jimmie H., 4,164,871, Cl. 73-432.00R.

Eli Lilly and Company: *See*—
Arnold, Wendell R., 4,165,229, Cl. 71-90.000.
Chou, Ta-Sen, 4,165,316, Cl. 260-239.00A.
Kukolja, Stjepan, 4,165,315, Cl. 260-239.00A.

Elias, John: *See*—
Mitchell, Henry M.; Elias, John; and Moorcroft, John, 4,164,866, Cl. 73-231.00R.

Ellington, Thomas M., Jr.: *See*—
Coumo, Salvatore R., Jr.; and Ellington, Thomas M., Jr., 4,165,178, Cl. 356-1.000.

Elmore, Lester C.; and Broxholm, Thomas M., deceased (by Broxholm, Anne K., administratrix), to Pulsepower Systems, Inc. Liquid propel-

lant modular gun incorporating dual cam operation and internal water cooling. 4,164,889, Cl. 89-7.000.

Elmore, Lester C.; and Broxholm, Thomas M., deceased (by Broxholm, Anne K., administratrix), to Pulsepower Systems, Inc. Liquid propellant modular gun incorporating dual cam operation and internal water cooling. 4,164,890, Cl. 89-185.000.

Eloy, Jacques; and Francois, Claude, to Automobiles Peugeot. Device for fixing a panel on an automobile dashboard. 4,164,986, Cl. 180-90.000.

Emde, Friedhelm: *See—*
Reinke, Friedhelm; and Emde, Friedhelm, 4,165,246, Cl. 148-150.000.

Emenaker, Robert C.: *See—*
Wagner, David A.; Doran, Daniel W.; and Emenaker, Robert C., 4,165,099, Cl. 280-708.000.

Emery Industries, Inc.: *See—*
Schlossman, Irwin S.; and Wiman, Robert E., 4,165,303, Cl. 260-22.00D.

Endoh, Toru; and Katoh, Masayuki, to Kubota, Ltd. Adamite roll material for a rolling mill. 4,165,407, Cl. 428-408.000.

Enerco, Inc.: *See—*
White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,165,216, Cl. 432-102.000.

Engeler, William E.; and Baertsch, Richard D., to General Electric Company. Analog charge transfer apparatus. 4,165,537, Cl. 365-45.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Reynolds, Victor R., 4,165,362, Cl. 423-53.000.

Engelsmann, Dieter; Hackenberg, Hubert; and Schroder, Rolf, to AGFA-Gevaert A.G. Exposure controls for photographic apparatus. 4,165,166, Cl. 354-21.000.

Engineering Systems Corporation: *See—*
Nicholson, Albert N., 4,164,911, Cl. 118-670.000.

Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sumiko, to CPC International Inc. Starch hydrolysate having less than 5 ppm of heavy metals. 4,165,240, Cl. 127-29.000.

Enomiya, Takuji: *See—*
Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraishi, Hiroshi; and Nakamura, Takato, 4,165,341, Cl. 260-600.00R.

Epstein, Albert; Graham, Glen; and Sklarz, William A., to Merck & Co., Inc. Riboflavin purification. 4,165,250, Cl. 435-267.000.

Erlbeck, Hans, to Knorr-Bremse GmbH. Control system of a railway vehicle air braking system. 4,165,136, Cl. 303-19.000.

Esposito, Joseph, Jr.; and Peluso, Andrew, Jr. Portable tennis locker organizer. 4,164,968, Cl. 150-1.000.

Establissements Francois Salomon et Fils: *See—*
Salomon, Georges P. J., 4,164,815, Cl. 33-3.00A.

ETS. Bobard Jeune S.A.: *See—*
Bobard, Charles E., 4,164,985, Cl. 180-53.00D.

Everett, Robert W., to American Air Filter Company, Inc. Indoor gun firing range enclosure having a ventilation system. 4,164,901, Cl. 98-33.00A.

Exley, John T.; Kuintzle, Charles, Jr.; and Tate, David L., to Avco Corporation. Rotary compressors. 4,164,845, Cl. 60-39.290.

Exxon Research & Engineering Co.: *See—*
Whitney, Thomas A.; and Langer, Arthur W., Jr., 4,165,330, Cl. 260-448.20B.

Fabrication de Maquinas, S.A.: *See—*
Martin, John K., 4,164,854, Cl. 62-536.000.

Failes, Michael, to Canadian Instrumentation and Research Limited. Automatic computing color meter. 4,165,180, Cl. 356-310.000.

Fair Equipment Company, Inc.: *See—*
Popovich, Mark, 4,165,075, Cl. 273-140.000.

Fairchild Camera and Instrument Corporation: *See—*
Varshney, Ramesh C.; Venkateswaran, Kalyanasundaram; and Amelio, Gilbert F., 4,165,541, Cl. 365-219.000.

Falce, Louis R., to Varian Associates, Inc. Electron tube with dispenser cathode. 4,165,473, Cl. 313-346.00R.

Falcione, Ronald D. Word game. 4,165,077, Cl. 273-239.000.

Farmer Foundation Company: *See—*
Farmer, Glyen D., 4,165,198, Cl. 405-243.000.

Farmer, Glyen D., to Farmer Foundation Company. Method for forming pier foundation columns. 4,165,198, Cl. 405-243.000.

Faust, Donald M.; and Weinert, Harry F., to Cascade Corporation. Slider roller side shifter for use on a forklift truck. 4,165,008, Cl. 414-750.000.

Favre, Michel: *See—*
de Panafieu, Arnaud; Villard, Michel; Baylac, Christiane; and Favre, Michel, 4,165,222, Cl. 65-2.000.

Fedders Corporation: *See—*
Anzalone, Carmen J., 4,164,852, Cl. 62-429.000.

Feddersohn, Richard C.; and Schaffer, William S. Curb slider device for skateboards. 4,165,090, Cl. 280-87.04A.

Federal Hose Manufacturing Corp.: *See—*
Foti, Sam J., 4,165,109, Cl. 285-177.000.

Federal-Mogul Corporation: *See—*
Sarnes, Myron C.; and Pathak, Ramjee, 4,165,243, Cl. 148-16.500.

Federal Screw Works: *See—*
Strand, Norman S., 4,164,971, Cl. 151-14.500.

Feiler, Robert. Score registering device. 4,164,910, Cl. 116-225.000.

Fejmert, Bernhard V. Mixer, preferably for the mixing of concrete. 4,165,185, Cl. 366-65.000.

Feldmaier, Douglas A.: *See—*
Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, 4,164,867, Cl. 73-346.000.

Feller, Thomas R., to Allis-Chalmers Corporation. Method and apparatus for supporting a sensor in a normally inacessible area of a machine. 4,164,864, Cl. 73-118.000.

F'Geppert, Erwin, to United States of America, Army. Constant force face seal. 4,165,081, Cl. 277-88.000.

Fielding, Ivor R.; Poppe, Wassily; and Slama, Francis J., to Standard Oil Company (Indiana). Flame retardant polymer composition. 4,165,309, Cl. 260-45.80A.

Figart, Earl C.; Kelly, J. Kevin; and Di Marcello, Richard A. Power distribution system. 4,165,443, Cl. 174-53.000.

FIP, S.A. de C.V.: *See—*
Works, Madden T., 4,165,064, Cl. 251-329.000.

Fisher Corporation: *See—*
Collins, Cecil A., 4,165,054, Cl. 242-107.700.

Fleet Engineers, Inc.: *See—*
Herlein, Daniel K., 4,165,092, Cl. 280-154.50R.

Fleming-Potter Company, Inc.: *See—*
Maarleveld, Adrianus, 4,164,902, Cl. 99-277.100.

Fletcher, Thomas A., to General Electric Company. Latch device. 4,164,804, Cl. 24-273.000.

Fliege, Werner: *See—*
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, 4,165,342, Cl. 260-603.00C.

Flory, Harold E. Signal-operated marking device. 4,165,513, Cl. 346-141.000.

Flower, Ralph F. J. Frictional couplings. 4,165,194, Cl. 403-320.000.

Flowers, Thomas E.; and MacDonnell, Gordon S. Data transmission systems (using internal systems equipment, services and procedures of telephone companies). 4,165,446, Cl. 179-2.0DP.

FMC Corporation: *See—*
Kempf, Dennis D., 4,165,084, Cl. 277-212.00C.

Foseco Trading A.G.: *See—*
Hazlehurst, Ian J.; and Willard, David C., 4,165,026, Cl. 222-591.000.

Foti, Sam J., to Federal Hose Manufacturing Corp. Wide-band compression coupling. 4,165,109, Cl. 285-177.000.

Foucras, Jacques; and Rodet, Georges, to Rhone-Poulenc Industries. Leakproof securing means for mounting a semi-permeable membrane to a support. 4,165,082, Cl. 277-166.000.

Fountain, Gordon H.: *See—*
Hill, J. Donald; and Fountain, Gordon H., 4,164,943, Cl. 128-348.000.

Francois, Claude: *See—*
Eloy, Jacques; and Francois, Claude, 4,164,986, Cl. 180-90.000.

Frederich, Fritz: *See—*
Stiefel, Christian; and Frederich, Fritz, 4,164,990, Cl. 182-48.000.

Freeman, Ernest A., Jr.: *See—*
Teed, Richard K.; and Freeman, Ernest A., Jr., 4,165,288, Cl. 210-23.00H.

Frewin, Le Roy F., to Inex, Incorporated. Article monitoring and reject apparatus. 4,165,277, Cl. 209-3.300.

Frey, Christoph: *See—*
von der Crone, Jost; and Frey, Christoph, 4,165,319, Cl. 260-325.0PH.

Frey, Gerald J. Track-type slide projector magazine. 4,165,162, Cl. 353-109.000.

Frolow, Jack L. Tennis racket. 4,165,071, Cl. 273-73.00C.

Frumkin, Felix M.: *See—*
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,165,135, Cl. 406-152.000.

Fry, Charles M.; and Hise, Henry W. Wind driven, high altitude power apparatus. 4,165,468, Cl. 290-55.000.

Fuji Photo Film Co., Ltd.: *See—*
Aotsuka, Yasuo, 4,165,236, Cl. 96-74.000.
Matsumoto, Nobuo; Tsuji, Osami; Kamiya, Yukio; and Shiozawa, Etsuo, 4,165,251, Cl. 156-584.000.
Shiba, Keisuke; Tajima, Tatsuya; and Sakaki, Hirokazu, 4,165,237, Cl. 96-76.00R.

Fujikawa, Tetsuzo; and Uda, Ryoji, to Kawaki Jukogyo Kabushiki Kaisha. Actuation device for a tachometer for an engine. 4,165,207, Cl. 417-313.000.

Fujimori, Motoyuki, to Kabushiki Kaisha Suwa Seikosha. Metallic lead plate and circuit structure for an electronic watch and method of assembly. 4,164,843, Cl. 58-23.00R.

Fujimoto, Masaharu: *See—*
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.

Fujimoto, Sachio: *See—*
Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.

Fujitsu Limited: *See—*
Ikeda, Hiroyuki; Ando, Moritoshi; and Inagaki, Takefumi, 4,165,464, Cl. 250-550.000.

Fujiwara, Kunio: *See—*
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,165,152, Cl. 350-96.300.

Fukuda, Tamotsu: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.0EE.

Fukui, Shoshin: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki;

Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.
Fukui, Yoshiharu: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,165,298, Cl. 252-429.00B.
Fulkerson, David E., to Honeywell Inc. Logic gates with forward biased diode load impedences. 4,165,470, Cl. 307-215.000.
Furuno, Akihisa: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.
Gabor, Antal: *See—*
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,165,135, Cl. 406-152.000.
Gabor Nadhazi: *See—*
Kaiser, Jarome, 4,165,117, Cl. 296-27.000.
Gabriel, Anthony P.; and Justiss, Jimmy, to General Cable Corporation. Telephone cable with improved shield combination. 4,165,442, Cl. 174-36.000.
Gabrielsen, Bernard L.: *See—*
Messick, William E.; and Gabrielsen, Bernard L., 4,164,831, Cl. 52-405.000.
GAF Corporation: *See—*
Chakrabarti, Paritosh M., 4,165,367, Cl. 424-47.000.
Gaffar, Maria C., to Colgate Palmolive Company. Dental prophylactic paste. 4,165,368, Cl. 424-52.000.
Gagneraud, Francis. Treating molten metallurgical slag. 4,165,233, Cl. 75-24.000.
Gale, Philip F., to Electricity Council, The. Cable fault location. 4,165,482, Cl. 324-52.000.
Ganguillet, Claude: *See—*
Ehrbar, Jean-Paul; and Ganguillet, Claude, 4,165,394, Cl. 427-40.000.
Garcia Corporation, The: *See—*
Neau, Alain, 4,165,095, Cl. 280-613.000.
Garland, J. David: *See—*
Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.
Garrett Corporation, The: *See—*
Aldrich, Howard P.; Burgess, Glenn A.; and Yamanaka, Clarence T., 4,164,895, Cl. 98-1.500.
Aldrich, Howard P., 4,164,896, Cl. 98-1.500.
Aldrich, Howard P.; Yamanaka, Clarence T.; and Burgess, Glenn A., 4,164,897, Cl. 98-1.500.
Aldrich, Howard P., 4,164,900, Cl. 98-1.500.
Burgess, Glenn A.; and Yamanaka, Clarence T., 4,164,898, Cl. 98-1.500.
Burgess, Glenn A., 4,164,899, Cl. 98-1.500.
Yamanaka, Clarence T., 4,164,894, Cl. 98-1.500.
Gavin, Joseph G., to Grumman Corporation. Solar heat collector construction. 4,164,932, Cl. 126-448.000.
Gearhart-Owen Industries, Inc.: *See—*
Hallmark, Bobby J., 4,164,886, Cl. 89-1.00C.
Geffon, Arthur P., to Sperry Rand Corporation. Circuit for detecting zero crossing points for data signal. 4,165,491, Cl. 328-150.000.
Gehman, Stacy E.: *See—*
Holmes, Allen B.; and Gehman, Stacy E., 4,165,503, Cl. 340-17.00R.
Genakis, Joseph M. Plugless pin tumbler cylinder. 4,164,857, Cl. 70-352.000.
General Cable Corporation: *See—*
Gabriel, Anthony P.; and Justiss, Jimmy, 4,165,442, Cl. 174-36.000.
General Connectors Corporation: *See—*
Affa, Stephen N.; and Yorke, Roy E., 4,165,107, Cl. 285-41.000.
General Electric Company: *See—*
Butler, Walter J.; and Eichelberger, Charles W., 4,165,478, Cl. 323-19.000.
Engeler, William E.; and Baertsch, Richard D., 4,165,537, Cl. 365-45.000.
Fletcher, Thomas A., 4,164,804, Cl. 24-273.000.
Hahn, Thomas M., 4,165,105, Cl. 285-19.000.
May, John E., 4,165,351, Cl. 264-66.000.
Smith, William E., 4,165,439, Cl. 568-804.000.
Weiser, Earnest F., 4,165,476, Cl. 318-493.000.
White, Dwain M., 4,165,422, Cl. 525-397.000.
General Foods Corporation: *See—*
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,165,390, Cl. 426-540.000.
General Motors Corporation: *See—*
Biskup, Edward J., 4,165,093, Cl. 280-220.000.
Clements, John A., 4,165,079, Cl. 277-9.500.
Haka, Raymond J., 4,164,918, Cl. 123-119.00A.
Hedeen, Carl E.; and Loose, Richard D., 4,165,119, Cl. 296-93.000.
Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, 4,164,867, Cl. 73-346.000.
Olander, William C.; Trabold, William G.; Harvey, Douglas J.; and Vest, Robert W., 4,165,452, Cl. 200-19.0DR.
Germonprez, Raymond L., to American Can Company. Binderless ink for jet printing. 4,165,399, Cl. 427-264.000.
Gestetner, Alfred, to Gestetner, Alfred. Loose-leaf folder. 4,165,193, Cl. 402-61.000.
Gibbs, Stephen R., to Burroughs Corporation. Method for chemically treating a single side of a workpiece. 4,165,252, Cl. 156-655.000.
Gietema, Jouke: *See—*
Brands, Antoon H.; and Gietema, Jouke, 4,165,506, Cl. 340-706.000.
Giggard, Earl D., to Continental Group, Inc., The. Child resistant overcap for easy opening container. 4,165,018, Cl. 220-284.000.
Gilli, Paul V.; and Beckmann, Georg, to Gilli, Paul Viktor. Method and apparatus for peak-load coverage and stop-gap reserve in steam power plants. 4,164,848, Cl. 60-652.000.
Gilli, Paul Viktor: *See—*
Gilli, Paul V.; and Beckmann, Georg, 4,164,848, Cl. 60-652.000.
Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., to ICI Americas Inc. Guanidine derivatives of imidazoles and thiazoles. 4,165,378, Cl. 424-270.000.
GKN Kent Alloys Limited: *See—*
Thompson, Joseph A., 4,165,131, Cl. 301-65.000.
Gladden, James B. Hose or pipe coupling. 4,165,106, Cl. 285-39.000.
Glassmeyer, John J., to Pullman Incorporated. Cleanable drain for tanker vehicle. 4,165,086, Cl. 280-5.00R.
Glasson, Richard E., to Cummins Engine Company, Inc. Controllable valve tappet for use with dual ramp cam. 4,164,917, Cl. 123-97.00B.
Glaxo Laboratories Limited: *See—*
Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., 4,165,430, Cl. 544-22.000.
Goegelman, Robert T.: *See—*
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.
Goff, Clifford E.: *See—*
Rogers, Arden D., Jr.; and Goff, Clifford E., 4,165,034, Cl. 236-12.00R.
Goff, Raymon L.; and Rau, Jim L., to TRW Inc. Control apparatus. 4,164,892, Cl. 91-375.00A.
Goff, Willie, Jr.: *See—*
Baumann, Gerald W.; Burdick, Robert L.; Goff, Willie, Jr.; and Libby, Edwin L., 4,165,168, Cl. 355-3.00R.
Goldberg, Estelle: *See—*
Einstein, Irving, 4,165,451, Cl. 179-178.000.
Golembeck, Gerald A., to United States Bedding Company, The. Zipper construction for mattresses and the like. 4,164,797, Cl. 5-470.000.
Goloff, Alexander, to Caterpillar Tractor Co. Oil-cooled engine valve. 4,164,957, Cl. 137-340.000.
Gonzalez-Dorner, Alberto C.: *See—*
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.
Goodyear Tire & Rubber Company, The: *See—*
Bauer, Richard G.; and Rubio, Diego C., 4,165,347, Cl. 525-69.000.
Kline, Richard H., 4,165,333, Cl. 260-455.00R.
Rinehart, Verne R., 4,165,420, Cl. 526-63.000.
Gordon, John A., to National Research Development Corporation. Apparatus for electronic encypherment of digital data. 4,165,444, Cl. 178-22.000.
Gordon, Joseph G., II; and Sincerbox, Glenn T., to International Business Machines Corporation. Amplitude modulation of light beam. 4,165,155, Cl. 350-285.000.
Gordon, Robert A., to Amway Corporation. Solid transparent cleanser. 4,165,293, Cl. 252-118.000.
Gosselink, Eugene P.; Richmond, James M.; and Wentler, George E., to Procter & Gamble Company, The. Detergent compounds and compositions. 4,165,334, Cl. 260-458.00R.
Gosteli, Jacques: *See—*
Marti, Franz; Somlo, Tibor; and Gosteli, Jacques, 4,165,268, Cl. 204-163.00R.
Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Optical control system for read out from information recording medium. 4,165,519, Cl. 358-128.000.
Goyne, Thomas E., to Cobe Laboratories, Inc. Potting pleated membrane. 4,165,287, Cl. 210-232.000.
Grabau, Edwin W., to Bell Telephone Laboratories, Incorporated. Connector clip. 4,165,142, Cl. 339-75.00R.
Gragson, James T., to Phillips Petroleum Company. Overbasing calcium petroleum sulfonates in lubricating oils employing monoalkylbenzene. 4,165,291, Cl. 252-33.000.
Graham, Glen: *See—*
Epstein, Albert; Graham, Glen; and Sklarz, William A., 4,165,250, Cl. 435-267.000.
Graham, William H.; and Shepard, Inella G., to Thiokol Corporation. Hydroxy terminated polybutadiene based polyurethane bound propellant grains. 4,165,421, Cl. 528-75.000.
Grain Processing Corporation: *See—*
Witt, Paul R., Jr., 4,165,388, Cl. 426-16.000.
Granbom, Bo; and Lundqvist, Gunnar. Sealing device at pressure fluid cylinders. 4,164,893, Cl. 92-88.000.
Grants, Valdis: *See—*
Dummermuth, Ernst; Grudowski, Raymond A.; Grants, Valdis; and Schmidt, Otomar, 4,165,534, Cl. 364-900.000.
Gravrok, Ralph E.; and Phillips, Clarence A. L., to Texaco Inc. Agricultural spray oils containing zinc dialkyldithiophosphates. 4,165,230, Cl. 71-127.000.
Greenberg, Jerome S., to Regal China Corporation. Fired ceramic bottle having threaded neck and method of making same. 4,165,350, Cl. 264-60.000.
Greenfield, Stanley A.; and Dupont, John A., to Rohm and Haas Company. Formaldehyde stabilized coating compositions. 4,165,318, Cl. 260-302.00A.
Gregory, Gordon I.: *See—*
Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., 4,165,430, Cl. 544-22.000.

Gregson, Richard P.; and Quinn, Ronald J., to Hoffmann-La Roche Inc. 1-Methyl-9β-D-ribofuranosyl-isoguanine. 4,165,427, Cl. 536-24.000.

Gromov, Valery S.: *See*—
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Gross, Francis M.: *See*—
White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,165,216, Cl. 432-102.000.

Grudowski, Raymond A.: *See*—
Dummermuth, Ernst; Grudowski, Raymond A.; Grants, Valdis; and Schmidt, Otomar, 4,165,534, Cl. 364-900.000.

Grumman Corporation: *See*—
Gavin, Joseph G., 4,164,932, Cl. 126-448.000.

GTE Sylvania Canada Limited: *See*—
Nattel, William, 4,165,010, Cl. 220-3.940.

GTE Sylvania Incorporated: *See*—
Ammann, Eugene O., 4,165,469, Cl. 307-426.000.
Puhak, Peter G., 4,165,143, Cl. 339-75.00T.

Gudmestad, Ragnar; and Blaha, Gerald E., to Artos Engineering Company. Apparatus for producing sets of accurately and identically sized wire leads. 4,164,808, Cl. 29-564.400.

Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, to Telecommunications Radioelectriques et Telephoniques T.R.T. Derangement detector in a receiver of a system for data transmission by means of phase modulation of a carrier. 4,165,488, Cl. 325-321.000.

Guillemin, Claude; and Mayen, Christian, to Prolabo. Safety device for chromatography apparatus. 4,165,284, Cl. 210-198.00C.

Haahjem Mekanishe A/S: *See*—
Haahjen, Kaare, 4,165,202, Cl. 414-313.000.

Haahjen, Kaare, to Haahjem Mekanishe A/S. Apparatus for emptying bulk material from a storage chamber. 4,165,202, Cl. 414-313.000.

Hackenberg, Hubert: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; and Schroder, Rolf, 4,165,166, Cl. 354-21.000.

Hacoba Textilmaschinen GmbH & Co. KG, Firma: *See*—
Dee, Rudolf, 4,165,055, Cl. 242-125.200.

Hagelthorn, Allan. Lamp shade and knock-down kit for forming same. 4,165,529, Cl. 362-352.000.

Hager, Jurgen; and Vieth, Walter. Disintegrating machine for food. 4,165,045, Cl. 241-282.000.

Hahn, Thomas M., to General Electric Company. Cabinet transition sleeve. 4,165,105, Cl. 285-19.000.

Haka, Raymond J., to General Motors Corporation. Exhaust gas recirculation control. 4,164,918, Cl. 123-119.00A.

Hall, John B.: *See*—
Wiegers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., 4,165,301, Cl. 252-522.000.

Hall, John L.; and Lee, Siu Au, to United States of America, Commerce. Fringe counting interferometric system for high accuracy measurements. 4,165,183, Cl. 356-346.000.

Hall, Lawrence G.; and Loveland, Robert S., to Perkin-Elmer Corporation, The. Acoustical wave flowmeter. 4,164,865, Cl. 73-194.00A.

Hallmark, Bobby J., to Gearhart-Owen Industries, Inc. Sealing projectile. 4,164,886, Cl. 89-1.00C.

Hamburg, James A.: *See*—
Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, 4,164,867, Cl. 73-346.000.

Hamilton, Martin W.: *See*—
Betts, Donald J.; and Hamilton, Martin W., 4,165,509, Cl. 340-620.000.

Hardwick, Kenneth G.; and Bagshaw, Trevor, to British Steel Corporation. Methods and apparatus relating to electroslag deposition. 4,164,973, Cl. 164-52.000.

Hardwick, Lester S.: *See*—
Lewis, Thomas J., Jr.; and Hardwick, Lester S., 4,165,096, Cl. 280-641.000.

Harrington, Timothy A., to Rockwell International Corporation. Protected amplifier apparatus. 4,165,493, Cl. 330-207.00P.

Harris, Eugene G.; and White, John F. Process for the production of heterocyclic compounds. 4,165,321, Cl. 260-340.200.

Harrison, Aline M.: *See*—
Mazzocchi, Paul H.; and Harrison, Aline M., 4,165,371, Cl. 424-244.000.

Harrison, Andrew P.: *See*—
Irven, John; and Harrison, Andrew P., 4,165,224, Cl. 65-3.00A.

Hartkorn, Hans W.: *See*—
Dittert, Karl; and Hartkorn, Hans W., 4,164,813, Cl. 30-272.00A.

Hartlaub, Jerome T., to Medtronic, Inc. Digital cardiac pacemaker medical device. 4,164,945, Cl. 128-419.0PG.

Harvey, Douglas J.: *See*—
Olander, William C.; Trabold, William G.; Harvey, Douglas J.; and Vest, Robert W., 4,165,452, Cl. 200-19.0DR.

Hasegawa, Gary K., to Continental Group, Inc., The. Lanced scored and punched easy opening panel arrangements. 4,165,015, Cl. 220-269.000.

Hasegawa, Gary K., to Continental Group, Inc., The. Child resistant pull tab. 4,165,017, Cl. 220-273.000.

Hashimoto, Akira: *See*—
Matoba, Yasuo; Hashimoto, Akira; and Sugahara, Mikio, 4,165,416, Cl. 525-346.000.

Hassan, Javathu K.; and Paivanas, John A., to International Business Machines Corporation. Pneumatic control of the motion of objects suspended on an air film. 4,165,132, Cl. 406-10.000.

Hathaway, Richard A., to Ampex Corporation. Automatic scan tracking using an additional sensing means on a bimorph. 4,165,523, Cl. 360-77.000.

Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio controlling apparatus for an internal combustion engine. 4,164,914, Cl. 123-32.0EE.

Hausenblas, Helmut, to Thyssen Industrie Aktiengesellschaft. Method of improving the guiding of reaction driven flying bodies for ground-to-ground employment. 4,165,057, Cl. 244-3.120.

Hawegawa, Gary K.: *See*—
Mascia, Carmen T.; and Hawegawa, Gary K., 4,165,025, Cl. 222-401.000.

Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, to Ono Pharmaceutical Company, Ltd. Δ^3-Prostaglandin analogs. 4,165,437, Cl. 560-121.000.

Haynes, John L., to Becton, Dickinson and Company. Particle counting apparatus utilizing various fluid resistors to maintain proper pressure differentials. 4,165,484, Cl. 324-71.0CP.

Hazlehurst, Ian J.; and Willard, David C., to Foseco Trading A.G. Tundish with expendable lining and easily removable nozzle. 4,165,026, Cl. 222-591.000.

Hechimovich, Nick: *See*—
Persha, Thomas J.; Lehto, Eino M.; Dueck, Richard; and Hechimovich, Nick, 4,165,160, Cl. 353-55.000.

Hedeen, Carl E.; and Loose, Richard D., to General Motors Corporation. Window reveal molding. 4,165,119, Cl. 296-93.000.

Hedge, Russell K.; and Huss, William S., to Mosinee Paper Company. Dispenser cabinet for sheet material and transfer mechanism. 4,165,138, Cl. 312-39.000.

Hedstrom Co.: *See*—
Boudreau, Robert J.; and Cunard, Joel C., 4,165,097, Cl. 280-647.000.

Heider, James E., to Owens-Illinois, Inc. Method of forming tubular plastic material having a flare-top edge using a blow head. 4,165,356, Cl. 264-519.000.

Heine, Diez: *See*—
Alfes, Franz; Heine, Diez; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, 4,165,431, Cl. 525-357.000.

Heinroth, Karl-August: *See*—
Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kaloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.

Hemmert, John R.: *See*—
Throop, C. Terry; Moffett, Richard E.; Hemmert, John R.; and Sawyer, Robert E., Jr., 4,165,450, Cl. 179-175.20C.

Hendrix, Joyce D.: *See*—
Daniels, Paul J., 4,164,964, Cl. 141-329.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Berger, Hans-Jurgen; Koch, Ferdinand; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,165,375, Cl. 424-263.000.
Linden, Heinrich; and Bornmann, Hans, 4,165,239, Cl. 106-300.000.

Hennemann, Jean, to Societe Anonyme dite: UNELEC. Switch with device to interlock the switch control if the contacts stick. 4,165,453, Cl. 200-153.00G.

Henstra, Rauke; van der Kley, Tonny; and Rens, Johannes N. M., to Hoogovens Ijmuiden, B.V. Apparatus for cleaning a coke oven door. 4,165,261, Cl. 202-241.000.

Herke, John. Well drilling bit dressing apparatus and method. 4,164,878, Cl. 76-5.00R.

Herlein, Daniel K., to Fleet Engineers, Inc. Bracket for removably mounting a mud flap assembly. 4,165,092, Cl. 280-154.50R.

Hermann Werner GmbH & Co.: *See*—
Lieser, Karl, 4,164,891, Cl. 409-165.000.

Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,165,424, Cl. 528-370.000.

Hernandez, Sebastian: *See*—
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.

Heule, Peter. Deburring tool for deburring bores. 4,165,201, Cl. 408-187.000.

Heurtey Metallurgie: *See*—
Devillard, Roger, 4,164,819, Cl. 34-72.000.

Heywang, Walter, to Siemens Aktiengesellschaft. Process for making a semiconductor component with electrical contacts. 4,164,811, Cl. 29-628.000.

Heywang, Walter, to Siemens Aktiengesellschaft. Method of purifying germanium bodies. 4,165,249, Cl. 156-605.000.

Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, to General Motors Corporation. Method of measurement of bulk temperatures of gas in engine cylinders. 4,164,867, Cl. 73-346.000.

Hiestand, Armin; and Rohringer, Peter, to Ciba-Geigy Corporation. Fire retardant s-triazine derivatives. 4,165,435, Cl. 544-197.000.

Higashi, Kazo; and Sawa, Kiyohiko, to Kobe Steel, Ltd. Crusher apparatus. 4,165,043, Cl. 241-236.000.

Hiland, Emelyn L.: *See*—
Johnson, Samuel M.; and Hiland, Emelyn L., 4,165,290, Cl. 252-8.800.

Hill, David T., to SmithKline Corporation. Bis(sulfide)gold(1+) salts. 4,165,380, Cl. 424-290.000.

Hill, Ira D.: *See*—
Wiegers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., 4,165,301, Cl. 252-522.000.
Hill, J. Donald; and Fountain, Gordon H., to Thoratec Laboratories Corporation. Catheter anchor. 4,164,943, Cl. 128-348.000.
Himes, Herman C.; and Koepnich, John P., to Price Brothers Company. Slab preparation apparatus. 4,165,215, Cl. 425-169.000.
Hirabayashi, Yoichi: *See*—
Suzki, Akiyoshi; and Hirabayashi, Yoichi, 4,165,149, Cl. 350-6.100.
Hirai, Jun, to Sony Corporation. Video signal recording and/or reproducing apparatus. 4,165,518, Cl. 358-8.000.
Hisamitsu Pharmaceutical Co., Inc.: *See*—
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.
Hisamoto, Iwao: *See*—
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.
Hise, Henry W.: *See*—
Fry, Charles M.; and Hise, Henry W., 4,165,468, Cl. 290-55.000.
Hoch, John J., to Deere & Company. Walk-behind filler with combined drag stake and wheel. 4,164,983, Cl. 172-43.000.
Hoechst Aktiengesellschaft: *See*—
Maag, Fritjof; and Unger, Friedrich, 4,164,837, Cl. 57-3.000.
Schlegel, Albert; and Wirtz, Peter, 4,165,313, Cl. 260-123.700.
Hoesch Werke Aktiengesellschaft: *See*—
Bottcher, Wolfgang; and Kopineck, Hermann-Josef, 4,164,873, Cl. 73-643.000.
Hofer, Gerald; and Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump. 4,164,921, Cl. 123-139.0AF.
Hofer, Gerald: *See*—
Eheim, Franz; and Hofer, Gerald, 4,164,922, Cl. 123-139.0AQ.
Hofer, Kurt: *See*—
Avar, Lajos; and Hofer, Kurt, 4,165,267, Cl. 204-159.150.
Hoffmann-La Roche Inc.: *See*—
Gregson, Richard P.; and Quinn, Ronald J., 4,165,427, Cl. 536-24.000.
Schoenenberger, Guido A., 4,165,312, Cl. 260-112.50R.
Hoffmeister, Elaine H.: *See*—
Anderson, Richard B.; Hoffmeister, Elaine H.; and Landholm, Richard A., 4,165,238, Cl. 96-119.00R.
Holder, Philippe. Tank for fluids under pressure. 4,165,019, Cl. 220-288.000.
Holdren, Fred V.; Hulsing, Rand H., II; and Steinke, Kurt E., to Sundstrand Data Control, Inc. Capacitive pick-off circuit. 4,165,483, Cl. 324-60.00C.
Holec N.V.: *See*—
Brinkman, Willem, 4,164,920, Cl. 123-139.00R.
Holk, Albert J., Jr., to Continental Group, Inc., The. Bonded can top. 4,165,011, Cl. 220-67.000.
Holland, Dewey G.: *See*—
Bechara, Ibrahim S.; and Holland, Dewey G., 4,165,412, Cl. 521-121.000.
Hollandse Signaalapparaten B.V.: *See*—
Brands, Antoon H.; and Gietema, Jouke, 4,165,506, Cl. 340-706.000.
Holley, Jasper B. Method and means for cleaning feed hoppers. 4,165,280, Cl. 209-245.000.
Holmes, Allen B.; and Gehman, Stacy E., to United States of America, Army. Hydrostatic seismic sensor. 4,165,503, Cl. 340-17.00R.
Holmes, Gordon D., to Davy-Loewy Limited. Rolling mill with roll bending unit. 4,164,858, Cl. 72-237.000.
Honeywell Inc.: *See*—
Fulkerson, David E., 4,165,470, Cl. 307-215.000.
Jenkins, Leonard E., Jr., 4,165,174, Cl. 355-29.000.
Peterson, Dean M., 4,165,512, Cl. 346-24.000.
Hongu, Masayuki, to Sony Corporation. Variable delay device. 4,165,498, Cl. 333-144.000.
Honma, Masanori: *See*—
Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, 4,165,281, Cl. 210-17.000.
Hoogovens Ijmuiden, B.V.: *See*—
Henstra, Rauke; van der Kley, Tonny; and Rens, Johannes N. M., 4,165,261, Cl. 202-241.000.
Hoover Universal, Inc.: *See*—
Ziegler, William E., 4,165,212, Cl. 425-382.00R.
Hopkins Manufacturing Corporation: *See*—
Thomas, Robert R., 4,164,801, Cl. 15-236.00R.
Hori, Hisashi: *See*—
Hori, Masaki; and Hori, Hisashi, 4,165,121, Cl. 296-57.00A.
Hori, Masaki; and Hori, Hisashi, to Jidosha Seiko Co., Ltd. Device for opening and closing a side plate of a loading box on a motor truck under no-load condition. 4,165,121, Cl. 296-57.00A.
Horio, Shunichiro: *See*—
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.
Horvat, Borut. Apparatus for active reduction of vertical vibrations of a vibrating mass. 4,165,066, Cl. 267-65.00D.
Hoselton, Harry, to Polysar Resins, Inc. Closures and container assemblies. 4,165,020, Cl. 220-306.000.
Howard, Charles W., to Early California Industries Inc. Apparatus for mixing fluids. 4,164,960, Cl. 137-604.000.
Howe, Leland D., Jr.; Paniccia, Albert E.; and Scotto, Vincent A., to International Business Machines Corporation. Clock pulse generator with selective pulse delay and pulse width control. 4,165,490, Cl. 328-60.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Microbicidal compositions. 4,165,381, Cl. 424-309.000.
Huber, Walter, to BASF Aktiengesellschaft. Analysis of solutions using chromatographic column. 4,165,219, Cl. 23-230.00R.
Hulsing, Rand H., II: *See*—
Holdren, Fred V.; Hulsing, Rand H., II; and Steinke, Kurt E., 4,165,483, Cl. 324-60.00C.
Huss, William S.: *See*—
Hedge, Russell K.; and Huss, William S., 4,165,138, Cl. 312-39.000.
Hutchison, Louis C. Device for reducing firearm recoil. 4,164,825, Cl. 42-1.00V.
Hutson, Howard A. High chair apron. 4,165,123, Cl. 297-153.000.
I Guzzini S.P.A.: *See*—
Sowden, George J., 4,165,530, Cl. 362-401.000.
Ichikawa, Tetsuya: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.
ICI Americas Inc.: *See*—
Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., 4,165,378, Cl. 424-270.000.
Jones, Derrick F.; and Yellin, Tobias O., 4,165,377, Cl. 424-270.000.
Ide, Hiroyuki: *See*—
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.
Ihara Chemical Industry Co. Ltd.: *See*—
Takahashi, Akio; and Saito, Hirokichi, 4,164,956, Cl. 137-242.000.
Iida, Noboru, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for producing plastic pipes having oval cross-sectional shape. 4,165,354, Cl. 264-178.00R.
Iijima, Eiji: *See*—
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,165,369, Cl. 424-70.000.
Iimure, Tamio: *See*—
Nakabayashi, Seizi; Matsuura, Taizo; and Iimure, Tamio, 4,165,265, Cl. 204-159.140.
Ikeda, Hiroyuki; Ando, Moritoshi; and Inagaki, Takefumi, to Fujitsu Limited. Light scanning system. 4,165,464, Cl. 250-550.000.
Imberg, Bengt U.: *See*—
Carlsson, Kurt H.; Imberg, Bengt U.; de Ronde, Frans C.; and Appelquist, Jan O., 4,165,454, Cl. 219-10.55F.
Imperial Chemical Industries Limited: *See*—
Speakman, Derek N. A., 4,165,418, Cl. 525-377.000.
Inagaki, Takefumi: *See*—
Ikeda, Hiroyuki; Ando, Moritoshi; and Inagaki, Takefumi, 4,165,464, Cl. 250-550.000.
Industrial Pollution Control Corp.: *See*—
Weber, Roland E.; and Zimmermann, Carl J., 4,165,283, Cl. 210-111.000.
Inex, Incorporated: *See*—
Frewin, Le Roy F., 4,165,277, Cl. 209-3.300.
Inficon Leybold-Heraeus Inc.: *See*—
Schlereth, Fritz H.; and Morgan, Michael J., 4,164,861, Cl. 73-1.00G.
Inland Steel Company: *See*—
Bugajski, Frank H.; and Patel, Jitendra G., 4,165,260, Cl. 201-40.000.
Inoue, Masaru: *See*—
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, 4,165,173, Cl. 355-15.000.
International Business Machines Corporation: *See*—
Aichelmann, Frederick J., Jr., 4,165,539, Cl. 365-183.000.
Baumann, Gerald W.; Burdick, Robert L.; Goff, Willie, Jr.; and Libby, Edwin L., 4,165,168, Cl. 355-3.00R.
Chang, Tai Hon P., 4,165,395, Cl. 427-43.000.
Colglazier, Donald F.; Kollar, Ernest P.; and Mares, Fred R., 4,165,069, Cl. 271-162.000.
Coumo, Salvatore R., Jr.; and Ellington, Thomas M., Jr., 4,165,178, Cl. 356-1.000.
Gordon, Joseph G., II; and Sincerbox, Glenn T., 4,165,155, Cl. 350-285.000.
Hassan, Javathu K.; and Paivanas, John A., 4,165,132, Cl. 406-10.000.
Howe, Leland D., Jr.; Paniccia, Albert E.; and Scotto, Vincent A., 4,165,490, Cl. 328-60.000.
Mortelmans, Joost; and Voegeli, Otto, 4,165,535, Cl. 365-2.000.
International Flavors & Fragrances Inc.: *See*—
Wiegers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., 4,165,301, Cl. 252-522.000.
International Standard Electric Corporation: *See*—
Irven, John; and Harrison, Andrew P., 4,165,224, Cl. 65-3.00A.
International Telephone & Telegraph Corp.: *See*—
Turcotte, Gordon W., 4,165,457, Cl. 219-516.000.
Iowa Manufacturing Company of Cedar Rapids, Iowa: *See*—
Schlarmann, Philip J., 4,165,184, Cl. 366-12.000.
Irons, Ronald E., to Aiken Industries Inc. Wideband RF switching matrix. 4,165,497, Cl. 333-101.000.
Irven, John; and Harrison, Andrew P., to International Standard Electric Corporation. Method of manufacturing optical fibre preforms. 4,165,224, Cl. 65-3.00A.

Ishihara, Kanehiro: *See*—
Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, to Mitsubishi Rayon Co., Ltd. Method for regenerating an oxidation catalyst. 4,165,296, Cl. 252-412.000.
Ishijima, Hiroshi, to Kabushiki Kaisha Daini Seikosha. Detecting apparatus for inserts, thickness unevenness or impurities. 4,165,461, Cl. 250-359.000.
Ishikawa, Haruo. Loudspeaker with improved voice coil support. 4,165,448, Cl. 179-115.5VC.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.
Ishima, Kazumi, to Ricoh Co., Ltd. Electrostatic recording multi-stylus electrode device. 4,165,514, Cl. 346-155.000.
Ishizuka, Hiroshi. Abrasive machine for stones. 4,164,828, Cl. 51-110.000.
Isleif, Karl-Heinz: *See*—
Jardin, Hans; Rottenfusser, Wolfgang; and Isleif, Karl-Heinz, 4,165,120, Cl. 296-137.00J.
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, to Toyo Soda Manufacturing Co. Ltd.; and (Zaidanhojin) Sagami Chemical Research Center. Addition compound of dipeptide derivative and amino acid derivative. 4,165,311, Cl. 260-112.50R.
Ito, Mitsuru. Device for tightening the waist of a garment. 4,164,792, Cl. 2-108.000.
Itzler, Daniel. Plumbing device. 4,165,110, Cl. 285-226.000.
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J. Process for producing pulp. 4,165,253, Cl. 162-19.000.
Ivashina, Evgeny N.: *See*—
Kostyanoi, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, to Konishiroku Photo Industry Co., Ltd. Toner removing means for photosensitive drums for electrophotography. 4,165,173, Cl. 355-15.000.
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, to Canon Kabushiki Kaisha. Color image formation apparatus. 4,165,165, Cl. 355-4.000.
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, to Yamanouchi Pharmaceutical Co., Ltd. 7α-methoxy-cephalosporanic acid derivatives. 4,165,429, Cl. 544-21.000.
Iwata, Nobuo: *See*—
Suzuki, Takami; and Iwata, Nobuo, 4,165,190, Cl. 400-144.200.
Iwatani, Akitoshi: *See*—
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.
Iyengar, Melicote R.: *See*—
Pye, E. Kendall; Maciag, Thomas; Weibel, Michael K.; and Iyengar, Melicote R., 4,165,258, Cl. 435-215.000.
J. F. Stevens & Co., Inc.: *See*—
Black, Thomas C., 4,164,963, Cl. 139-11.000.
J. I. Case Company: *See*—
Draney, Robert G., 4,164,982, Cl. 172-40.000.
Kulhavy, Joseph T.; and Shelton, Donald G., 4,164,915, Cl. 123-32.00R.
Jabsen, Felix S., to Babcock & Wilcox Company, The. Fuel element grid plate with corrugation and bosses. 4,165,256, Cl. 176-78.000.
Jackson, Milton L. Multicomponent thermal conductivity analyzer. 4,164,862, Cl. 73-27.00R.
Jacobs, Norman L. Soldering flux and method of using same. 4,165,244, Cl. 148-23.000.
Jacobs, Stanley C.: *See*—
Kinosz, Donald L.; Jennings, Charles E.; and Jacobs, Stanley C., 4,165,263, Cl. 204-67.000.
Jaconette, John J., to Jenkins Brothers. Swing check valve. 4,164,958, Cl. 137-527.000.
Jaeckh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, to BASF Aktiengesellschaft. Manufacture of ferromagnetic metal particles essentially consisting of iron. 4,165,232, Cl. 75-0.5AA.
Jaffey, Irving. Separator for shredded materials. 4,165,278, Cl. 209-45.000.
Jagers, Leopold. Guide for a sawblade. 4,164,883, Cl. 83-488.000.
Jai, Kenneth. Machine for cleaning tubes and pipes. 4,164,799, Cl. 15-104.10R.
Jain, Ravinder K.: *See*—
Bergman, John G., Jr.; Jain, Ravinder K.; and Wagner, Sigurd, 4,165,515, Cl. 357-6.000.
James, James R., to Accuratio Systems, Inc. Apparatus for mixing and dispensing reactive fluids. 4,165,187, Cl. 366-150.000.
James Mackie & Sons Limited: *See*—
Mackie, Gordon, 4,165,047, Cl. 242-43.00A.
James, Paul M. Rear projection microfilm reader/printer. 4,165,177, Cl. 355-45.000.
James River Corp.: *See*—
Volkman, Roy G., 4,165,352, Cl. 264-113.000.
Jankowiak, Roman: *See*—
Naab, Carlton W.; and Jankowiak, Roman, 4,164,953, Cl. 137-72.000.
Japan Crown Cork Co., Ltd.: *See*—
Murayama, Kashiwa, 4,165,009, Cl. 215-230.000.
Jardin, Hans; Rottenfusser, Wolfgang; and Isleif, Karl-Heinz, to Webasto-Werk W. Baier GmbH & Co. Vehicle roof. 4,165,120, Cl. 296-137.00J.
Jaunin, Jean-Pierre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Timepiece display indicator. 4,164,844, Cl. 58-39.500.
JDS Products, Inc.: *See*—
Walker, Thomas G., 4,164,817, Cl. 33-371.000.
Jende-Strid, Inga B.: *See*—
von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., 4,165,387, Cl. 426-16.000.
Jenerl, Inc.: *See*—
Jensen, Edward A., 4,165,118, Cl. 296-50.000.
Jenkins Brothers: *See*—
Jaconette, John J., 4,164,958, Cl. 137-527.000.
Jenkins, Henry H. Die chase apparatus. 4,164,881, Cl. 83-128.000.
Jenkins, James H. Thermal deflector. 4,164,931, Cl. 126-132.000.
Jenkins, Leonard E., Jr., to Honeywell Inc. Recording apparatus. 4,165,174, Cl. 355-29.000.
Jennings, Charles E.: *See*—
Kinosz, Donald L.; Jennings, Charles E.; and Jacobs, Stanley C., 4,165,263, Cl. 204-67.000.
Jensen, Edward A., to Jenerl, Inc. Louvered tailgate with automatically adjustable vanes. 4,165,118, Cl. 296-50.000.
Jernigan, Emory J. Apparatus for making substantially impenetrable members. 4,165,067, Cl. 269-40.000.
Jessup, David G.: *See*—
Bentley, Stanley L.; and Jessup, David G., 4,165,022, Cl. 222-76.000.
Jidosha Seiko Co., Ltd.: *See*—
Hori, Masaki; and Hori, Hisashi, 4,165,121, Cl. 296-57.00A.
Johansen, Svend B. Method for combustion of gaseous fuels and flue gases. 4,164,847, Cl. 60-274.000.
Johnson, Albert O. Material handling system for wide range of materials and flow rates. 4,165,133, Cl. 406-109.000.
Johnson, David R.: *See*—
Juckniess, Paul R.; and Johnson, David R., 4,165,262, Cl. 204-64.00T.
Johnson, Ernest K. Portable urinal. 4,164,795, Cl. 4-144.100.
Johnson, Jay. Process for clamping, sealing, and aiding the filling of matched molds. 4,165,358, Cl. 264-571.000.
Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. 9-Hydroxyhexahydrodibenzo[b,d]pyrans, 1-substituted-9-hydroxyhexahydrodibenzo[b,d]pyrans and intermediates therefor. 4,165,323, Cl. 260-345.200.
Johnson, Samuel M.; and Hiland, Emelyn L., to Procter & Gamble Company, The. Fabric care composition containing starch and quaternary ammonium compound. 4,165,290, Cl. 252-8.800.
Johnston, Harold E. Cooking stove. 4,164,930, Cl. 126-38.000.
Johnstone, Richard: *See*—
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,164,810, Cl. 29-568.000.
Jokinen, Olli, to Rauma-Repola Oy. Method and apparatus for the installation of the support element of a crane. 4,165,005, Cl. 212-145.000.
Jones, Dennis R. Magnetic tape cleaner. 4,165,526, Cl. 360-137.000.
Jones, Derrick F.; and Yellin, Tobias O., to ICI Americas Inc. Guanidino imidazoles and thiazoles. 4,165,377, Cl. 424-270.000.
Jones, Elborn W.: *See*—
United States of America, National Aeronautics and Space Administration; Rose, Stephen D.; Crouch, Charles E.; and Jones, Elborn W., 4,165,460, Cl. 250-253.000.
Jonsson, Bjorn E. R., to Telefonaktiebolaget L M Ericsson. Identification of a faulty address decoder in a function unit of a computer having a plurality of function units with redundant address decoders. 4,165,533, Cl. 364-900.000.
Jordan, Charles P. Inflatable bag. 4,164,970, Cl. 150-3.000.
Jouquey, Alain: *See*—
Bardoneschi, Roland; Jouquey, Alain; and Philibert, Daniel, 4,165,326, Cl. 260-397.500.
Juckniess, Paul R.; and Johnson, David R., to Dow Chemical Company, The. Method of electrowinning titanium. 4,165,262, Cl. 204-64.00T.
Jurenz, Rolf; and Becker, Claus, to Veb Pentacon Dresden Kamera-Undkinowerke. Photographic camera. 4,165,167, Cl. 354-53.000.
Jurischka, Hans-Dieter: *See*—
Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kaloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.
Justiss, Jimmy: *See*—
Gabriel, Anthony P.; and Justiss, Jimmy, 4,165,442, Cl. 174-36.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Ishijima, Hiroshi, 4,165,461, Cl. 250-359.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Komiyama, Kunihiko; Kanai, Seikichi; and Okada, Masaru, 4,164,913, Cl. 123-30.00C.
Kabushiki Kaisha Suwa Seikosha: *See—*
Fujimori, Motoyuki, 4,164,843, Cl. 58-23.00R.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Suzuki, Yoshihisa; Ueda, Shozo; Taniguchi, Toshinori; and Onoue, Keiji, 4,165,046, Cl. 242-35.50A.
Kadija, Igor V., to Olin Corporation. Diaphragms for use in the electrolysis of alkali metal chlorides. 4,165,271, Cl. 204-252.000.
Kadowaki, Hidejiro: *See—*
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.
Kagawa, Kunihiko, to Mas Co., Ltd. Snow-surface driving vehicle. 4,165,087, Cl. 280-16.000.
Kahan, Frederick M.: *See—*
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, to Merck & Co., Inc. N-acetyl thienamycin. 4,165,379, Cl. 424-274.000.
Kaiser, Jarome, to Gabor Nadhazi. Collapsible camping trailer. 4,165,117, Cl. 296-27.000.
Kaiser, Reinhard: *See—*
Alfes, Franz; Heine, Diez; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, 4,165,431, Cl. 525-357.000.
Kakehashi, Ikutaro, to Roland Corporation. Device for producing a chorus effect. 4,164,884, Cl. 84-1.240.
Kakutani, Tsunehiro: *See—*
Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.
Kaloff, Hans: *See—*
Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kaloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.
Kamata, Norio: *See—*
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sumiko, 4,165,240, Cl. 127-29.000.
Kaminskas, Rimvydas A., to Standun, Inc. Internal gaseous fluid stripper for can bodymakers and the like. 4,164,860, Cl. 72-345.000.
Kamiya, Yukio: *See—*
Matsumoto, Nobuo; Tsuji, Osami; Kamiya, Yukio; and Shiozawa, Etsuo, 4,165,251, Cl. 156-584.000.
Kanai, Seikichi: *See—*
Komiyama, Kunihiko; Kanai, Seikichi; and Okada, Masaru, 4,164,913, Cl. 123-30.00C.
Kanatani, Masataka; and Awamura, Daikichi, to Toppan Printing Co., Ltd. System for checking printed condition of printed sheet matters. 4,165,465, Cl. 250-559.000.
Kanno, Sumiko: *See—*
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sumiko, 4,165,240, Cl. 127-29.000.
Kano, Masafumi: *See—*
Tugukuni, Hideyoshi; and Kano, Masafumi, 4,165,406,. Cl. 428-407.000.
Kantar, Anthony M.; and Pribyl, George E. Apparatus for matching skis. 4,164,875, Cl. 73-812.000.
Kao Soap Co., Ltd.: *See—*
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,165,369, Cl. 424-70.000.
Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, 4,165,327, Cl. 260-397.250.
Karr, Michael A., III: *See—*
Di Domenico, Mauro, Jr.; Karr, Michael A., III; and Rich, Theodore C., 4,165,496, Cl. 331-94.50S.
Kataoka, Nagamasa: *See—*
Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,165,228, Cl. 65-111.000.
Kato, Masaaki: *See—*
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, 4,165,296, Cl. 252-412.000.
Kato, Takahisa: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.
Katoh, Masayuki: *See—*
Endoh, Toru; and Katoh, Masayuki, 4,165,407, Cl. 428-408.000.
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, to Daikin Kogyo Co., Ltd. 2-Hydroxy-1,1,2,3,3-pentahydro-perfluoroalkyl derivatives, their production and use. 4,165,338, Cl. 260-584.00R.
Kaufmann, Ernst: *See—*
Strien, Werner; Zwanziger, Rudolph; and Kaufmann, Ernst, 4,165,126, Cl. 297-284.000.
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, to Kuraray Co., Ltd.; and Minaminihon Rakuno Kyodo Kabushiki Kaisha. Process for producing fibrous high-protein food. 4,165,392, Cl. 426-657.000.
Kawaki Jukogyo Kabushiki Kaisha: *See—*
Fujikawa, Tetsuzo; and Uda, Ryoji, 4,165,207, Cl. 417-313.000.
Kazansky, Viktor V.: *See—*
Kostyanoi, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.
Kearney & Trecker Corporation: *See—*
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,164,810, Cl. 29-568.000.
Kehr, Clifton L.: *See—*
Marans, Nelson S.; Kehr, Clifton L.; and Murch, Robert M., 4,165,411, Cl. 521-107.000.
Keiper Automobiltechnik GmbH & Co. KG: *See—*
Strowick, Willibald; and Werner, Paul, 4,165,128, Cl. 297-367.000.
Kellerstrass, Donald L. Water gun game with revolvable target movable along a line. 4,165,073, Cl. 273-101.000.
Kelly, J. Kevin: *See—*
Figart, Earl C.; Kelly, J. Kevin; and Di Marcello, Richard A., 4,165,443, Cl. 174-53.000.
Kelly, Roger A.; and Pekar, Howard G., to R. O. Hull & Company, Inc. Treatment of metal parts to provide rust-inhibiting coatings by phosphating and electrophoretically depositing a siccative organic coating. 4,165,242, Cl. 148-6.15Z.
Kempf, Dennis D., to FMC Corporation. Reciprocating pump packing. 4,165,084, Cl. 277-212.00C.
Kendall, Thomas L.; Downing, Leo G.; and Ray, James A., to Toro Company, The. Automatic irrigation sprinkler system controller. 4,165,532, Cl. 364-420.000.
Kenin, Valery G.: *See—*
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.
Kersten, Ralf: *See—*
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Keuro GmbH & Co., KG.: *See—*
Stolzer, Paul, 4,165,068, Cl. 269-136.000.
Khrol, Jury S.: *See—*
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.
Kihara, Keiichi: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.
Kikuhara, Iwao. Bread and a method of producing the same. 4,165,386, Cl. 426-9.000.
Kim, Kwang Y.: *See—*
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.
Kim, Leo, to Shell Oil Company. Catalytic hydration of ethylene oxide to ethylene glycol. 4,165,440, Cl. 568-867.000.
Kimata, Kei; Nakazeki, Tsugito; and Oshima, Saburo, to NTN Toyo Bearing Co. Ltd. Fuel injection device for internal combustion engines. 4,164,923, Cl. 123-140.0MC.
Kimura, Katsuhiko: *See—*
Miyashita, Kiyoshi; and Kimura, Katsuhiko, 4,165,169, Cl. 355-3.0DR.
Kindlmann, Peter J., to Echlin Manufacturing Company, The. Electronic ignition advance circuit. 4,164,926, Cl. 123-148.00E.
King, Frederick D.: *See—*
Duck, Gary S.; and King, Frederick D., 4,165,150, Cl. 350-96.150.
King Instrument Corporation: *See—*
Berube, Richard G., 4,165,050, Cl. 242-68.300.
King, John O., Jr. Method of forming a coldworked joint. 4,164,807, Cl. 29-523.000.
Kinosz, Donald L.; Jennings, Charles E.; and Jacobs, Stanley C., to Aluminum Company of America. Method of preparing an electrolytic cell for operation. 4,165,263, Cl. 204-67.000.
Kistler Instrumente AG: *See—*
Dubs, Walter; and Preiss, Georg, 4,165,402, Cl. 428-64.000.
Kita, Katsuhiko, to Narumi China Corporation. Process for preparing an element of a dual-in-line ceramic package provided with a layer of sealing glass. 4,165,226, Cl. 65-42.000.
Kitamura, Kazuo; Takabayashi, Fumiki; Shibata, Fumio; Watabe, Kaname; and Azumi, Toshinori, to Teijin Limited. Halohydrocarbon treatment of a glycol and waste dye liquor followed by water extraction of the glycol. 4,165,217, Cl. 8-81.000.
Kitamura, Yoshishige, to Nippon Electric Co., Ltd. Read-only memory. 4,165,538, Cl. 365-104.000.
Kitchell, Thorne C.: *See—*
Bunger, Arthur W.; and Kitchell, Thorne C., 4,165,030, Cl. 229-15.000.
Klee, Rudolf J.: *See—*
Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kaloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.
Kleefeldt, Frank, to Arn. Kiekert Sohne. Motor-vehicle door latch. 4,165,112, Cl. 292-216.000.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Antioxidants. 4,165,333, Cl. 260-455.00R.

Klingenberg, James C., to Dana Corporation. Disposable centrifugal separator with baffle means. 4,165,032, Cl. 233-23.00R.
Klostermark, Bernt. Personal use device for removing tartar from the inner side of teeth. 4,164,814, Cl. 32-69.000.
Knight, Charles B., deceased (by Knight, June S., personal representative), to Westinghouse Electric Corp. Nuclear fuel rack lateral support and preload device. 4,165,255, Cl. 176-30.000.
Knight, June S., personal representative: *See*—
Knight, Charles B., deceased, 4,165,255, Cl. 176-30.000.
Knoffsinger, Fred E.: *See*—
White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,165,216, Cl. 432-102.000.
Knopick, Robert A.; and Morlock, Allen B., to Steraplast, Inc. Disposable drape for surgical table. 4,164,941, Cl. 128-132.00D.
Knorr-Bremse GmbH: *See*—
Erlbeck, Hans, 4,165,136, Cl. 303-19.000.
Kobale, Manfred; and Krueger, Hans, to Siemens Aktiengesellschaft. Liquid crystal cell having a glass fiber frame. 4,165,157, Cl. 350-343.000.
Kobayashi, Masao: *See*—
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, 4,165,296, Cl. 252-412.000.
Kobe Steel, Ltd.: *See*—
Higashi, Kazo; and Sawa, Kiyohiko, 4,165,043, Cl. 241-236.000.
Kobelt, Jacob. Air cooled brake disc. 4,164,993, Cl. 188-218.0XL.
Koch, Ferdinand: *See*—
Berger, Hans-Jurgen; Koch, Ferdinand; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,165,375, Cl. 424-263.000.
Koch, Kenneth F.: *See*—
Wessler, Louis E.; Koch, Kenneth F.; and Cleveland, Andrew J., 4,165,520, Cl. 358-280.000.
Koel, Gerrit J.; and Druyvesteyn, Willem F., to U.S. Philips Corporation. Magnetic head having a core provided on a substrate by means of thin-film technology. 4,165,525, Cl. 360-125.000.
Koepnich, John P.: *See*—
Himes, Herman C.; and Koepnich, John P., 4,165,215, Cl. 425-169.000.
Koester, Eberhard: *See*—
Jaeckh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.
Kohler, Hans W.; and Sommer, Helmut, to United States of America, Army. Lumped neutralization coil arrangement for inductance fuze. 4,164,905, Cl. 102-212.000.
Kohner, Inc.: *See*—
Palumbo, Nunzio, 4,164,827, Cl. 46-119.000.
Koiso, Junichi: *See*—
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, 4,165,173, Cl. 355-15.000.
Koizumi, Takayuki; and Usami, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Signal decision system. 4,165,458, Cl. 235-92.0PE.
Kokiso, Masakazu: *See*—
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, 4,165,173, Cl. 355-15.000.
Kolb, Gunter: *See*—
Alfes, Franz; Heine, Diez; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, 4,165,431, Cl. 525-357.000.
Koleske, Joseph V.: *See*—
Smith, Oliver W.; and Koleske, Joseph V., 4,165,345, Cl. 525-419.000.
Kolganov, Gennady S.: *See*—
Kostyanoi, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.
Kolin, Alexander, to University of California, The Regents of the. Orthogonal electromagnetic flow and diameter sensor system. 4,164,939, Cl. 128-692.000.
Kollar, Ernest P.: *See*—
Colglazier, Donald F.; Kollar, Ernest P.; and Mares, Fred R., 4,165,069, Cl. 271-162.000.
Komatsu, Toshiaki: *See*—
Yamada, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,165,373, Cl. 424-246.000.
Komiyama, Kunihiko; Kanai, Seikichi; and Okada, Masaru, to Kabushiki Kaisha Komatsu Seisakusho. Combustion chamber for an internal combustion engine of direct injection type. 4,164,913, Cl. 123-30.00C.
Kondo, Eiichi: *See*—
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.
Konig, Heinz. Cable drum for automatic rewinding of a cable. 4,165,053, Cl. 242-107.100.
Konishi, Yoshitaka: *See*—
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,165,437, Cl. 560-121.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, 4,165,173, Cl. 355-15.000.
Kopineck, Hermann-Josef: *See*—
Bottcher, Wolfgang; and Kopineck, Hermann-Josef, 4,164,873, Cl. 73-643.000.
Koppel, Mikhail A.: *See*—
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,165,135, Cl. 406-152.000.
Koppers Company, Inc.: *See*—
Calistrat, Michael M., 4,164,855, Cl. 64-2.00P.
Sefton, Robert H.; and Carlson, John D., 4,165,413, Cl. 521-128.000.
Kori, Seiji: *See*—
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,165,437, Cl. 560-121.000.
Kornatowski, Boleslaw: *See*—
Cook, Albert N.; Kornatowski, Boleslaw; and Tyburcy, Raymond S., 4,165,144, Cl. 339-88.00R.
Kostyanoi, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N. Process for producing ferrovanadium alloys. 4,165,234, Cl. 75-60.000.
Kraft, Dieter: *See*—
Dodt, Hans-Walter; and Kraft, Dieter, 4,164,994, Cl. 188-296.000.
Kramer, Gideon A. Multiple optics slide projector. 4,165,161, Cl. 353-86.000.
Kraus, Theodore C.: *See*—
Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,165,432, Cl. 536-4.000.
Krause, Peter L., to Burroughs Corporation. Data generator for disc file addresses. 4,165,531, Cl. 364-200.000.
Krickovich, Eli G. Snow remover and vacuum sweeper. 4,164,820, Cl. 37-12.000.
Krjukov, Vitaly M.: *See*—
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.
Krueger, Hans: *See*—
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Kubo, Shunichi: *See*—
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.
Kubota, Ltd.: *See*—
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Kuehn, John P., to Audio Dynamics Corporation. Flip-up stylus protector for a phonograph cartridge. 4,165,078, Cl. 274-1.00R.
Kuintzle, Charles, Jr.: *See*—
Exley, John T.; Kuintzle, Charles, Jr.; and Tate, David L., 4,164,845, Cl. 60-39.290.
Kukolja, Stjepan, to Eli Lilly and Company. Sulfinyl halides and their preparation from penicillin sulfoxides. 4,165,315, Cl. 260-239.00A.
Kulhavy, Joseph T.; and Shelton, Donald G., to J. I. Case Company. Conversion of gasoline to diesel engine. 4,164,915, Cl. 123-32.00R.
Kulpa, Stanley J.: *See*—
Schroeder, Hobe; and Kulpa, Stanley J., 4,165,324, Cl. 260-346.700.
Kumazawa, Toshiharu, to Mitsubishi Precision Co., Ltd. Device for atomizing and dispersing a fluid. 4,165,038, Cl. 239-405.000.
Kuniyasu, Kenji: *See*—
Nishimura, Kenji; Miyazaki, Haruhiko; Kuniyasu, Kenji; and Ono, Satoru, 4,165,328, Cl. 260-404.000.
Kunz, Walter: *See*—
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,165,381, Cl. 424-309.000.
Kupperman, Dennis: *See*—
Kupperman, Sam; and Kupperman, Dennis, 4,165,061, Cl. 249-92.000.
Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Integrally formed molding unit for freezing a liquid with a portion of the unit severable for forming a handle for the frozen product. 4,165,061, Cl. 249-92.000.
Kuraray Co., Ltd.: *See*—
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.
Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, to Niigata Engineering Co., Ltd. Method and unit for wastewater treatment by microorganisms. 4,165,281, Cl. 210-17.000.
Kurosaki, Shiro: *See*—
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,165,152, Cl. 350-96.300.
Kwant, Pieter B., to Shell Oil Company. Process for the preparation of synthetic crude oil. 4,165,274, Cl. 208-93.000.
Kwiatkowski, George T.: *See*—
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L. & C. Steinmuller GmbH: *See*—
Dorling, Rolf, 4,165,021, Cl. 220-468.000.
Labavia - S.G.E.: *See*—
Lagarde, Roger, 4,164,987, Cl. 180-271.000.
Lagarde, Roger, to Labavia - S.G.E. Control device for the deceleration of a heavy vehicle. 4,164,987, Cl. 180-271.000.
Lake Shore Roentgenology, Ltd.: *See*—
Rosenberg, Carl S., 4,165,376, Cl. 424-267.000.
Land, Edwin H., to Polaroid Corporation. Translucent screen. 4,165,153, Cl. 350-126.000.

Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., to Singer Company, The. Microprocessor controlled filmstrip projector. 4,165,159, Cl. 353-15.000.

Landholm, Richard A.: *See*—
Anderson, Richard B.; Hoffmeister, Elaine H.; and Landholm, Richard A., 4,165,238, Cl. 96-119.00R.

Landwehr, Gotz: *See*—
Lux, Helmut; and Landwehr, Gotz, 4,164,989, Cl. 181-265.000.

Langer, Alois A., to Mirowski, Mieczyslaw. Fault detection circuit for permanently implanted cardioverter. 4,164,946, Cl. 128-419.00D.

Langer, Arthur W., Jr.: *See*—
Whitney, Thomas A.; and Langer, Arthur W., Jr., 4,165,330, Cl. 260-448.20B.

Larsen, Darrell R., to Minneapolis Electric Steel Castings Company. Shell liner assembly for ore grinding mills. 4,165,041, Cl. 241-182.000.

Laska, Ronald C.; and Pierce, Wayne R., to Pako Corporation. Photographic film measurement with interchangeable light guiding modules. 4,165,176, Cl. 355-68.000.

Latzina, Kurt; Martin, Hans; and Wolf, Richard, to Robert Bosch GmbH. Pressurized medium powered device. 4,165,203, Cl. 415-113.000.

Laviolette, Maurice A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Tubular projectile. 4,164,904, Cl. 102-92.700.

Layton, Wilbur T.; and Schwartz, Sidney J., to Burroughs Corporation. Magnetic bubble package. 4,165,536, Cl. 365-2.000.

Lee, Siu Au: *See*—
Hall, John L.; and Lee, Siu Au, 4,165,183, Cl. 356-346.000.

Lefebvre, Elsa G., to Dianis Creations, Inc. Water-in-oil emulsion for skin moisturizing. 4,165,385, Cl. 424-365.000.

Lehmann, Bernd: *See*—
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.

Lehmann, Werner: *See*—
Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, 4,164,925, Cl. 123-140.00R.

Lehto, Eino M.: *See*—
Persha, Thomas J.; Lehto, Eino M.; Dueck, Richard; and Hechimovich, Nick, 4,165,160, Cl. 353-55.000.

Lemanski, Savarian F. Camera having multiple image device. 4,165,163, Cl. 354-122.000.

Lemmen, Conrardus J. G., to Oce-van der Grinten N.V. Electrographic apparatus and process. 4,165,171, Cl. 355-15.000.

Levine, Ralph; and Olechowski, Jerome R., to Cities Service Conmpany. Dehydration of tertiary butyl alcohol. 4,165,343, Cl. 585-638.000.

Lewis, Thomas J., Jr.; and Hardwick, Lester S. Storable utility trailer. 4,165,096, Cl. 280-641.000.

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Chilpan, Kurt C.; and Lewis, William L., 4,164,840, Cl. 57-313.000.

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Baumann, Gerald W.; Burdick, Robert L.; Goff, Willie, Jr.; and Libby, Edwin L., 4,165,168, Cl. 355-3.00R.

Liepins, Sigurds; and Crane, James W., to Coleman Company, Inc., The. Projectile loader for gun. 4,164,929, Cl. 124-76.000.

Lieser, Karl, to Hermann Werner GmbH & Co. Machine for simultaneously milling of several grooves in rotating workpieces. 4,164,891, Cl. 409-165.000.

Linden, Heinrich; and Bornmann, Hans, to Henkel Kommanditgesellschaft auf Aktien. Process for dispersing pigments and fillers using carboxylic acid esters of tertiary alkylolamines. 4,165,239, Cl. 106-300.000.

Lippert, Axel: *See*—
Casper, Clemens; Lippert, Axel; and Sajben, Johannes O., 4,165,360, Cl. 422-202.000.

Lippler, Remy R.: *See*—
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, 4,165,423, Cl. 528-370.000.

Little Gem Manufacturing, Inc.: *See*—
Bodart, Ronald A., 4,164,965, Cl. 144-3.00K.

Lockwood, Phyllis, executrix: *See*—
Otto, Carl L., Jr., deceased; and Lockwood, Phyllis, executrix, 4,165,205, Cl. 417-262.000.

Loctite Corporation: *See*—
DeMarco, JoAnn, 4,165,400, Cl. 427-295.000.

Loeser, Werner: *See*—
Jaeckh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.

Login, Robert B.; and Newkirk, David D., to BASF Wyandotte Corporation. Fiber lubricants based upon fatty esters of heteric polyoxyalkylated alcohols. 4,165,405, Cl. 428-395.000.

Looger, Lonnie L.; and Cobb, Bernie J., to United States of America, Army. Rocket remote engagement mechanism. 4,164,888, Cl. 89-1.814.

Loose, Richard D.: *See*—
Hedeen, Carl E.; and Loose, Richard D., 4,165,119, Cl. 296-93.000.

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Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,165,336, Cl. 260-511.000.

Losik, Viktor I.: *See*—
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Loveland, Robert S.: *See*—
Hall, Lawrence G.; and Loveland, Robert S., 4,164,865, Cl. 73-194.00A.

Lowi, Alvin, Jr. Combined engine cooling system and waste-heat driven automotive air conditioning system. 4,164,850, Cl. 62-196.00C.

Lowin, Kenneth J.: *See*—
Davis, Lewis K.; and Lowin, Kenneth J., 4,164,919, Cl. 123-136.000.

Luber, Beulah, Intestate Successor: *See*—
Luber, Lawrence B., deceased; and Luber, Beulah, Intestate Successor, 4,164,992, Cl. 186-1.00R.

Luber, Beulah F.: *See*—
Luber, Lawrence B., deceased; and Luber, Beulah, Intestate Successor, 4,164,992, Cl. 186-1.00R.

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Ludwig, Alfred, to Sulzer Brothers Limited. Method for the fabrication of internally weld-cladded pipe elbows. 4,165,245, Cl. 148-127.000.

Lundquist, Ingemar H., to Valleylab. Intravenous delivery pump. 4,165,208, Cl. 417-565.000.

Lundqvist, Gunnar: *See*—
Granbom, Bo; and Lundqvist, Gunnar, 4,164,893, Cl. 92-88.000.

Lupke, Gerd P. H.; and Lupke, Manfred A. A. Apparatus for producing corrugated thermoplastic. 4,165,214, Cl. 425-532.000.

Lupke, Manfred A. A.: *See*—
Lupke, Gerd P. H.; and Lupke, Manfred A. A., 4,165,214, Cl. 425-532.000.

Luttke, Wolfgang: *See*—
Schafer, Fritz P.; and Luttke, Wolfgang, 4,165,434, Cl. 544-197.000.

Lutz, Albert W.; and Diehl, Robert E., to American Cyanamid Company. 2,6-Dinitroaniline herbicides. 4,165,231, Cl. 71-121.000.

Lutz, Timothy J. Covered cup. 4,165,013, Cl. 220-215.000.

Lux, Helmut; and Landwehr, Gotz, to Andreas Stihl. Muffler, especially for portable internal combustion engine. 4,164,989, Cl. 181-265.000.

Lydick, Richard P.: *See*—
Alley, Lawrence E., III; Lydick, Richard P.; and Stanley, Robert E., 4,164,944, Cl. 128-419.0PG.

Lyman, John B.; and Stewart, Bruce E., to Whirlpool Corporation. Vacuum cleaner attachment wand with demountable electrical connector. 4,165,140, Cl. 339-15.000.

Maag, Fritjof; and Unger, Friedrich, to Hoechst Aktiengesellschaft. Method of forming a wrapped yarn. 4,164,837, Cl. 57-3.000.

Maarleveld, Adrianus, to Fleming-Potter Company, Inc. Fermentation tank. 4,164,902, Cl. 99-277.100.

MacDonnell, Gordon S.: *See*—
Flowers, Thomas E.; and MacDonnell, Gordon S., 4,165,446, Cl. 179-2.0DP.

Maciag, Thomas: *See*—
Pye, E. Kendall; Maciag, Thomas; Weibel, Michael K.; and Iyengar, Melicote R., 4,165,258, Cl. 435-215.000.

Mackie, Gordon, to James Mackie & Sons Limited. Yarn winder. 4,165,047, Cl. 242-43.00A.

Macovski, Albert; and Rosenfeld, Dov. Variable code gamma ray imaging system. 4,165,462, Cl. 250-363.00S.

Maeda, Chiaki: *See*—
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.

Maeda, Tetsuya: *See*—
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.

Magnetic Controls Company: *See*—
Buck, Josef J., 4,165,147, Cl. 339-182.00R.

Magnoux, Claude R.: *See*—
du Chaffaut, Jean A.; Magnoux, Claude R.; and Oberto, Patrick L. C., 4,165,389, Cl. 426-42.000.

Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, to Robert Bosch GmbH. Centrifugal rpm governor for internal combustion engines. 4,164,925, Cl. 123-140.00R.

Maine, Jack. Method of fabricating wood composite panels having enhanced fire retardancy. 4,165,409, Cl. 428-535.000.

Makino, Niro, to Nippondenso Co., Ltd. Centrifugal speed governor for an internal combustion engine. 4,164,924, Cl. 123-140.00R.

Maltby, Edgar W., to Eaton Corporation. Thermally actuated valve for plural fluid sources. 4,165,035, Cl. 236-86.000.

Mangus, James D., to United States of America, Energy. Method and apparatus for thermal power generation. 4,164,849, Cl. 60-679.000.

Manion, Francis M.: *See*—
Drzewiecki, Tadeusz M.; and Manion, Francis M., 4,164,961, Cl. 137-823.000.

Mannin Industries Ltd.: *See*—
Mitchell, Henry M.; Elias, John; and Moorcroft, John, 4,164,866, Cl. 73-231.00R.

Manokhin, Anatoly I.: *See*—
Kostyanoi, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.

Mansei Kogyo Kabushiki Kaisha: *See*—
Goto, Kenjiro, 4,165,519, Cl. 358-128.000.

Mansfield, Peter, to National Research Development Corporation. Nuclear magnetic resonance apparatus and methods. 4,165,479, Cl. 324-0.50A.
Marans, Nelson S.; Kehr, Clifton L.; and Murch, Robert M., to W. R. Grace & Co. Flame retardant urethane and method. 4,165,411, Cl. 521-107.000.
Mares, Fred R.: *See*—
Colglazier, Donald F.; Kollar, Ernest P.; and Mares, Fred R., 4,165,069, Cl. 271-162.000.
Marini, Paolo: *See*—
Colletta, Angelo; and Marini, Paolo, 4,165,220, Cl. 44-23.000.
Markwood, Robert E., to Philip Morris Incorporated. Filler for pressure vessel. 4,165,012, Cl. 220-71.000.
Marles, Kevin C.; and Spencer, Brian W., to Solar Apparatus & Equipment Limited. Solar heating panels. 4,164,935, Cl. 126-447.000.
Marra, Aldo. Fire escape device. 4,164,991, Cl. 182-70.000.
Marsico, Joseph J. Luminous effects device. 4,164,823, Cl. 40-427.000.
Marsili, Leonardo: *See*—
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,165,317, Cl. 260-239.30P.
Marti, Franz; Somlo, Tibor; and Gosteli, Jacques, to Ciba-Geigy AG. Process for the production of substituted toluene compounds. 4,165,268, Cl. 204-163.00R.
Martin, Hans: *See*—
Latzina, Kurt; Martin, Hans; and Wolf, Richard, 4,165,203, Cl. 415-113.000.
Martin, John K., to Fabrication de Maquinas, S.A. Desalination method with mercury refrigerant. 4,164,854, Cl. 62-536.000.
Martin, Kenneth R., to Warner & Swasey Company, The. Machine tool coolant system. 4,164,879, Cl. 82-2.00R.
Martin, Thomas B.; and Pieters, Ferdinandus A., to Micropump Corporation. Three gear pump with module construction. 4,165,206, Cl. 417-310.000.
Mas Co., Ltd.: *See*—
Kagawa, Kunihiko, 4,165,087, Cl. 280-16.000.
Mascia, Carmen T.; and Hawegawa, Gary K., to Continental Group, Inc., The. Propellantless aerosol with fluid pressure generating pump. 4,165,025, Cl. 222-401.000.
Mason, Charles H. Method and apparatus for self-feeding and sawing wooden workpieces. 4,164,966, Cl. 144-312.000.
Mason, Warren S. Impact tunneling machine with cutters spaced for equal work. 4,165,130, Cl. 299-62.000.
Masuyama, Tetsuo: *See*—
Okano, Takeshi; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,165,441, Cl. 585-444.000.
Matoba, Yasuo; Hashimoto, Akira; and Sugahara, Mikio, to Osaka Soda Co. Ltd. Cured or uncured chlorinated polyethylene composition and process for curing uncured chlorinated polyethylene. 4,165,416, Cl. 525-346.000.
Matsumoto, Nobuo; Tsuji, Osami; Kamiya, Yukio; and Shiozawa, Etsuo, to Fuji Photo Film Co., Ltd. Stripping and developing device. 4,165,251, Cl. 156-584.000.
Matsumura, Kazuhiro: *See*—
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,165,298, Cl. 252-429.00B.
Matsuoka, Hirokazu: *See*—
Tanae, Fumio; and Matsuoka, Hirokazu, 4,164,836, Cl. 57-2.000.
Matsuura, Taizo: *See*—
Nakabayashi, Seizi; Matsuura, Taizo; and Iimure, Tamio, 4,165,265, Cl. 204-159.140.
Matsuzaki, Tsuneo: *See*—
Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, 4,165,281, Cl. 210-17.000.
Matsuzawa, Hideo: *See*—
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, 4,165,296, Cl. 252-412.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Schafer, Fritz P.; and Luttke, Wolfgang, 4,165,434, Cl. 544-197.000.
May, John E., to General Electric Company. Method of manufacturing a metal oxide varistor. 4,165,351, Cl. 264-66.000.
Mayen, Christian: *See*—
Guillemin, Claude; and Mayen, Christian, 4,165,284, Cl. 210-198.00C.
Mayfield, Esther O. Steam or hot-water boiler. 4,165,455, Cl. 219-10.55A.
Mazzocchi, Paul H.; and Harrison, Aline M., to Research Corporation. 1,2,3,4,5,6-Hexahydro-1,6-methano-3-benzazocines. 4,165,371, Cl. 424-244.000.
McAllister, Ian R.: *See*—
Bennett, John A.; McAllister, Ian R.; and Welsh, Howard, 4,165,282, Cl. 210-40.000.
McCall Associates, Inc.: *See*—
Diven, Jeffrey K., 4,164,949, Cl. 131-173.000.
McCarson, Donald M. Apparatus and method for combined solar and heat pump heating and cooling system. 4,165,037, Cl. 237-1.00A.
McClanahan, Jimmie D.: *See*—
Oswalt, Leon M.; and McClanahan, Jimmie D., 4,165,024, Cl. 222-105.000.
McDonough, John. Cooler. 4,164,853, Cl. 62-457.000.
McFarland, Douglas F. Inertia controlled conveyor clutch. 4,164,995, Cl. 192-103.00C.
McJones, Robert W.: *See*—
Qasim, Javed; and McJones, Robert W., 4,165,063, Cl. 251-168.000.
McLean, Daniel C.: *See*—
Shaler, Amos J.; and McLean, Daniel C., 4,164,951, Cl. 132-31.00R.
Meagher, Richard R., to Rescon Corporation, The. Product authentication system. 4,165,002, Cl. 206-459.000.
Meares, Hurshel. Basketball tossing device. 4,164,928, Cl. 124-16.000.
Meckler, Milton. Multi source heat pump air conditioning system. 4,165,036, Cl. 237-1.00A.
Medical Laboratory Automation, Inc.: *See*—
Scordato, Emil A.; and Pratt, Hugh W., 4,164,870, Cl. 73-425.600.
Medtronic, Inc.: *See*—
Hartlaub, Jerome T., 4,164,945, Cl. 128-419.0PG.
Mehnert, Gottfried. Apparatus for multi-stage blow molding of hollow shaped articles. 4,165,213, Cl. 425-530.000.
Meissner, Bernd: *See*—
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, 4,165,342, Cl. 260-603.00C.
Mellberg, James R., to Colgate Palmolive Company. Dental prophylactic paste. 4,165,366, Cl. 424-49.000.
Mellen, Craig R. Asphalt spreading machine. 4,165,192, Cl. 401-48.000.
Melvin, Lawrence S., Jr.: *See*—
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,165,323, Cl. 260-345.200.
Merck & Co., Inc.: *See*—
Epstein, Albert; Graham, Glen; and Sklarz, William A., 4,165,250, Cl. 435-267.000.
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.
Mericle, John E. Spacer for workpiece supporting apparatus used with power tools having high speed cutting members. 4,164,882, Cl. 83-409.000.
Messick, William E.; and Gabrielsen, Bernard L. Heat insulating and sound absorbing concrete wall panel. 4,164,831, Cl. 52-405.000.
Metzler, Norman P.: *See*—
Metzler, Phares H.; and Metzler, Norman P., 4,164,826, Cl. 43-42.050.
Metzler, Phares H.; and Metzler, Norman P. Salmon jig. 4,164,826, Cl. 43-42.050.
Meyer, J. Joe, to Western-Cullen-Hayes, Inc. Portable derail. 4,165,060, Cl. 246-163.000.
Meyer-Simon, Eugen: *See*—
Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, 4,165,363, Cl. 423-342.000.
Michael, William R.: *See*—
Sundie, Richard D.; and Michael, William R., 4,165,305, Cl. 260-29.40R.
Michno, Michael J., Jr.: *See*—
Spector, Myron; Kwiatkowski, George T.; Smarock, Walter H.; and Michno, Michael J., Jr., 4,164,794, Cl. 3-1.912.
Micropump Corporation: *See*—
Martin, Thomas B.; and Pieters, Ferdinandus A., 4,165,206, Cl. 417-310.000.
Midorikawa, Akira: *See*—
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, 4,165,172, Cl. 355-15.000.
Mikata, Tsuruo: *See*—
Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, 4,165,327, Cl. 260-397.250.
Milberger, Ernest C.: *See*—
Dolhyj, Serge R.; and Milberger, Ernest C., 4,165,300, Cl. 252-462.000.
Millars Wellpoint International Ltd.: *See*—
Allen, Ronald N., 4,164,955, Cl. 137-202.000.
Miller, Richard J.: *See*—
Cassatt, Gary G.; and Miller, Richard J., 4,164,874, Cl. 73-799.000.
Milstein, Joseph B. Process and apparatus for preparation of single crystals and textured polycrystals. 4,165,361, Cl. 422-249.000.
Minaminihon Rakuno Kyodo Kabushiki Kaisha: *See*—
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.
Mindell, Marvin I.: *See*—
Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.
Minneapolis Electric Steel Castings Company: *See*—
Larsen, Darrell R., 4,165,041, Cl. 241-182.000.
Minnesota Mining and Manufacturing Company: *See*—
Nidelkoff, James G., 4,164,824, Cl. 40-450.000.
Ogden, P. H.; and Pennicott, H., 4,165,397, Cl. 427-140.000.
Mirowski, Mieczyslaw: *See*—
Langer, Alois A., 4,164,946, Cl. 128-419.00D.
Misawa, Akira, to Pioneer Electronic Corporation. Tuning indicating device having a two-dimensional display of two values. 4,165,500, Cl. 334-86.000.
Mitchell, Charles S., to Silonics, Inc. Paper advance mechanism for an ink jet printer. 4,165,029, Cl. 226-25.000.
Mitchell, Henry M.; Elias, John; and Moorcroft, John, to Mannin Industries Ltd. Apparatus for monitoring amount and directions of fluid flow in fluid power systems. 4,164,866, Cl. 73-231.00R.
Mitchell, John G., to California Injection Molding Co., Inc. Mold with porous cavity vent. 4,165,062, Cl. 249-141.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Okano, Takeshi; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,165,441, Cl. 585-444.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Koizumi, Takayuki; and Usami, Teruo, 4,165,458, Cl. 235-92.0PE.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Yoshinaka, Shigeo; Doya, Masaharu; Uchiyama, Seiji; and Nozaki, Sadao, 4,165,337, Cl. 260-544.00D.

Mitsubishi Precision Co., Ltd.: *See*—
Kumazawa, Toshiharu, 4,165,038, Cl. 239-405.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, 4,165,296, Cl. 252-412.000.
Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, 4,164,818, Cl. 34-12.000.
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.

Miyakawa, Seiichi: *See*—
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, 4,165,172, Cl. 355-15.000.

Miyashita, Kiyoshi; and Kimura, Katsuhiko, to Olympus Optical Company Limited. Photosensitive drum for electrographic apparatus. 4,165,169, Cl. 355-3.0DR.

Miyata, Konosuke: *See*—
Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.

Miyata, Satoru: *See*—
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.

Miyazaki, Haruhiko: *See*—
Nishimura, Kenji; Miyazaki, Haruhiko; Kuniyasu, Kenji; and Ono, Satoru, 4,165,328, Cl. 260-404.000.

Mizuno, Shioji; and Sugie, Toshinori, to Dai Nippon Ink & Chemicals Incorporated. Process for preparation of molding resins. 4,165,307, Cl. 260-40.0TN.

Moat, Nicholas W.: *See*—
Davis, Bryan T.; and Moat, Nicholas W., 4,165,292, Cl. 252-51.50A.

Mobil Oil Corporation: *See*—
Davis, Kenneth G., 4,165,304, Cl. 260-22.0CB.

Mochizuki, Manabu: *See*—
Suzuki, Kohji; Mochizuki, Manabu; Oyama, Hajime; and Ohnuma, Teruyuki, 4,165,393, Cl. 427-18.000.

Moffett, Richard E.: *See*—
Throop, C. Terry; Moffett, Richard E.; Hemmert, John R.; and Sawyer, Robert E., Jr., 4,165,450, Cl. 179-175.20C.

Moissonnier, Rene; and Seiler, Hans, to Sandoz Ltd. Mass-dyeing of polyester with anthraquinone and benzanthrone dyes. 4,165,306, Cl. 260-40.00P.

Moller, Godfrey T. Video recorder and playback unit including remotely operable timed fast forward advance. 4,165,522, Cl. 360-73.000.

Moller, Jens L., to Continental Group, Inc., The. Easy open reclosable end unit. 4,165,016, Cl. 220-270.000.

Momiyama, Kikuo, to Canon Kabushiki Kaisha. Two-reflecting catadioptric optical system. 4,165,151, Cl. 350-201.000.

Monsanto Company: *See*—
Morita, Eiichi, 4,165,310, Cl. 260-45.85A.
Serlin, Irving, 4,165,308, Cl. 260-42.520.
Wolfinger, Mark D., 4,165,417, Cl. 525-3.000.

Mookherjee, Braja D.: *See*—
Wiegers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., 4,165,301, Cl. 252-522.000.

Moorcroft, John: *See*—
Mitchell, Henry M.; Elias, John; and Moorcroft, John, 4,164,866, Cl. 73-231.00R.

Moore, George G. I.; and Sell, Donald M., to Riker Laboratories, Inc. Anti-inflammatory method. 4,165,383, Cl. 424-331.000.

Morgan, Michael J.: *See*—
Schlereth, Fritz H.; and Morgan, Michael J., 4,164,861, Cl. 73-1.00G.

Mori, Kaoru: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.

Morita, Eiichi, to Monsanto Company. Scorch inhibited vulcanizable rubber compositions containing carbamic acid esters. 4,165,310, Cl. 260-45.85A.

Morlock, Allen B.: *See*—
Knopick, Robert A.; and Morlock, Allen B., 4,164,941, Cl. 128-132.00D.

Morrison, H. Frank, to University of California, The Regents of the. Prospecting system using rotating superconducting electromagnetic dipole. 4,165,480, Cl. 324-6.000.

Mortelmans, Joost; and Voegeli, Otto, to International Business Machines Corporation. Bubble memory drive system using a picture frame core and a reflection box. 4,165,535, Cl. 365-2.000.

Mosinee Paper Company: *See*—
Hedge, Russell K.; and Huss, William S., 4,165,138, Cl. 312-39.000.

Moskowitz, Seymour; and Cole, Rossa W., to Curtiss-Wright Corporation. Gas turbine power plant utilizing a fluidized-bed combustor. 4,164,846, Cl. 60-39.46S.

Motola, Marcel; and Besson, Yves, to Thomson-CSF. Recirculation circuit for repetition of an analog pulse signal. 4,165,492, Cl. 328-165.000.

Motorola, Inc.: *See*—
Remedi, James J., 4,165,504, Cl. 340-167.00R.

Mueller, Daniel L.: *See*—
Donohue, James M.; and Mueller, Daniel L., 4,165,170, Cl. 355-14.000.

Mueller, Martin, to Owens-Illinois, Inc. Article transport device and method. 4,164,997, Cl. 198-427.000.

Muenkel, Raymond L.: *See*—
Nubani, Jawdat I.; and Muenkel, Raymond L., 4,165,227, Cl. 65-56.000.

Multivac Sepp Haggenmuller KG: *See*—
Vetter, Arthur, 4,165,357, Cl. 264-548.000.

Murakami, Masuo: *See*—
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.

Murayama, Kashiwa, to Japan Crown Cork Co., Ltd. Bottle closure for sales promotion. 4,165,009, Cl. 215-230.000.

Murch, Robert M.: *See*—
Marans, Nelson S.; Kehr, Clifton L.; and Murch, Robert M., 4,165,411, Cl. 521-107.000.

Myers, David J., to Texas Instruments Incorporated. Optoelectronic displays using uniformly spaced arrays of semi-sphere light-emitting diodes. 4,165,474, Cl. 313-500.000.

Myers, Thomas E. Agricultural harvesting assembly. 4,164,981, Cl. 171-50.000.

Naab, Carlton W.; and Jankowiak, Roman, to Conax Corporation. Normally-closed electro-thermally operated flood valve. 4,164,953, Cl. 137-72.000.

Nagai, Masayuki: *See*—
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.

Nagano, Noriaki: *See*—
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.

Nagano, Yoshinobu: *See*—
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.

Nakabayashi, Seizi; Matsuura, Taizo; and Iimure, Tamio, to Nippon Paint Co., Ltd. Multi-stage irradiation method of curing a photocurable coating composition. 4,165,265, Cl. 204-159.140.

Nakagawa, Akira: *See*—
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.

Nakagome, Takenari: *See*—
Yamada, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,165,373, Cl. 424-246.000.

Nakaji, Tarushige: *See*—
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.

Nakamura, Rinjiro, to Chiyoda Chemical Engineering and Construction Company Ltd. Apparatus for fuel supply to spark ignition type internal combustion engine. 4,165,348, Cl. 261-36.00A.

Nakamura, Takato: *See*—
Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraishi, Hiroshi; and Nakamura, Takato, 4,165,341, Cl. 260-600.00R.

Nakase, Takamichi: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.0EE.

Nakashima, Yoichi: *See*—
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.

Nakazeki, Tsugito: *See*—
Kimata, Kei; Nakazeki, Tsugito; and Oshima, Saburo, 4,164,923, Cl. 123-140.0MC.

Narayan, Thirumurti; Patton, John T., Jr.; Cenker, Moses; and Wulff, Harald P., to BASF Wyandotte Corporation. Urethane-modified isocyanurate foams having improved insulating and flame retardant properties. 4,165,414, Cl. 521-129.000.

Narumi China Corporation: *See*—
Kita, Katsuhiko, 4,165,226, Cl. 65-42.000.

National Distillers and Chemical Corporation: *See*—
Corbett, Herbert O., 4,165,210, Cl. 425-133.500.

National Musical String Company: *See*—
Stone, W. Norman; and Allmansberger, Robert A., 4,164,806, Cl. 29-517.000.

National Research Development Corporation: *See*—
Dell, Christopher C., 4,165,279, Cl. 209-169.000.
Gordon, John A., 4,165,444, Cl. 178-22.000.
Mansfield, Peter, 4,165,479, Cl. 324-0.50A.

National Seating Company: *See*—
Owen, Hugh J., 4,165,125, Cl. 297-220.000.

Nattel, William, to GTE Sylvania Canada Limited. Electrical outlet box. 4,165,010, Cl. 220-3.940.

NCR Corporation: *See*—
Bodmer, Jerome R., 4,165,102, Cl. 282-27.500.
Bodmer, Jerome R., 4,165,103, Cl. 282-27.500.

Neau, Alain, to Garcia Corporation, The. Self restoring safety ski binding. 4,165,095, Cl. 280-613.000.

Nelson, Dale W. Combination cart. 4,165,088, Cl. 280-47.350.

Newkirk, David D.: *See*—
Login, Robert B.; and Newkirk, David D., 4,165,405, Cl. 428-395.000.

Nichols, Edward L., III: *See*—
Campbell, Paul K.; and Nichols, Edward L., III, 4,165,148, Cl. 339-276.00R.

Nicholson, Albert N., to Engineering Systems Corporation. Apparatus for re-inking printing ribbons. 4,164,911, Cl. 118-670.000.
Nidelkoff, James G., to Minnesota Mining and Manufacturing Company. Changeable character sign structure. 4,164,824, Cl. 40-450.000.
Nielsen, Axel L. Sump pump. 4,165,204, Cl. 417-40.000.
Nielsen, Holger; and Salling, Per, to A/S N. Foss Electric. Identification system. 4,165,033, Cl. 235-439.000.
Nieviarovski, Leslav M., to Norca Corporation. Schnabel car bogie. 4,164,906, Cl. 105-367.000.
Nihon Technical Kabushiki Kaisha: *See—*
Ohashi, Tamaki; and Sato, Susumu, 4,165,499, Cl. 334-47.000.
Niigata Engineering Co., Ltd.: *See—*
Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, 4,165,281, Cl. 210-17.000.
Ninomiya, Takeshi, to Sony Corporation. Velocity error control apparatus. 4,165,524, Cl. 360-36.000.
Nippon Electric Co., Ltd.: *See—*
Kitamura, Yoshishige, 4,165,538, Cl. 365-104.000.
Nippon Kogaku K.K.: *See—*
Akasaka, Shigeo, 4,165,164, Cl. 354-289.000.
Nippon Paint Co., Ltd.: *See—*
Nakabayashi, Seizi; Matsuura, Taizo; and Iimure, Tamio, 4,165,265, Cl. 204-159.140.
Nippon Precision Optical Instrument Co., Ltd.: *See—*
Sato, Ko, 4,165,179, Cl. 356-246.000.
Nippon S R S, Inc.: *See—*
Sato, Ko, 4,165,179, Cl. 356-246.000.
Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.0EE.
Nippon Zeon Co. Ltd.: *See—*
Okuda, Takao; and Wada, Akira, 4,165,344, Cl. 525-111.000.
Nippondenso Co., Ltd.: *See—*
Makino, Niro, 4,164,924, Cl. 123-140.00R.
Nishimura, Kenji; Miyazaki, Haruhiko; Kuniyasu, Kenji; and Ono, Satoru, to Ube Industries, Ltd. Process for separating 11-cyanoundecanoic acid, cyclohexanone and ε-caprolactam. 4,165,328, Cl. 260-404.000.
Nishimura, Shigeaki: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.
Nissim, Joseph, to Rockwell International Corporation. Motion simulating display apparatus. 4,165,510, Cl. 340-754.000.
Nitto Chemical Industry Co., Ltd.: *See—*
Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, 4,164,818, Cl. 34-12.000.
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. Indoleacetic acid ester derivatives. 4,165,428, Cl. 546-273.000.
Nonaka, Yuji: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.
Nooner, Daryl W., to Texaco Inc. Reservoir stabilization by treating water sensitive clays. 4,164,979, Cl. 166-288.000.
Norca Corporation: *See—*
Nieviarovski, Leslav M., 4,164,906, Cl. 105-367.000.
Northern Telecom Inc.: *See—*
Throop, C. Terry; Moffett, Richard E.; Hemmert, John R.; and Sawyer, Robert E., Jr., 4,165,450, Cl. 179-175.20C.
Northern Telecom Limited: *See—*
Duck, Gary S.; and King, Frederick D., 4,165,150, Cl. 350-96.150.
Novak, Robert M.: *See—*
Wiegers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., 4,165,301, Cl. 252-522.000.
Nozaki, Sadao: *See—*
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NTN Toyo Bearing Co. Ltd.: *See—*
Kimata, Kei; Nakazeki, Tsugito; and Oshima, Saburo, 4,164,923, Cl. 123-140.0MC.
Nubani, Jawdat I.; and Muenkel, Raymond L., to RCA Corporation. Stem-sealing method for assembling electron tubes including improved cullet collection. 4,165,227, Cl. 65-56.000.
Nutter, Larry L. Truss hoist. 4,165,114, Cl. 294-19.00R.
N.V. Centrale Suiker Maatschappij: *See—*
Wind, Evert; and de Vletter, Robbert, 4,165,285, Cl. 210-195.300.
Oberto, Patrick L. C.: *See—*
du Chaffaut, Jean A.; Magnoux, Claude R.; and Oberto, Patrick L. C., 4,165,389, Cl. 426-42.000.
Oce-van der Grinten N.V.: *See—*
Lemmen, Conrardus J. G., 4,165,171, Cl. 355-15.000.
O'Connell, Lawrence E., to Delbar Products, Inc. Outside mounted vehicle mirror with multiple rotation axes. 4,165,156, Cl. 350-307.000.
Ogden, P. H.; and Pennicott, H., to Minnesota Mining and Manufacturing Company. Repair of glass laminates. 4,165,397, Cl. 427-140.000.
Oger, Robert: *See—*
Baudoin, Jean-Claude; and Oger, Robert, 4,165,116, Cl. 294-86.00R.
Ohashi, Tamaki; and Sato, Susumu, to Nihon Technical Kabushiki Kaisha. Channel-selecting, presettable, rotary type tuning device. 4,165,499, Cl. 334-47.000.
Ohio & Penna. Fuels, Inc.: *See—*
Valenti, Nicholas, 4,165,221, Cl. 44-26.000.
Ohlinger, Manfred: *See—*
Jaeckh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.
Ohmori, Muneki: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.
Ohnuma, Teruyuki: *See—*
Suzuki, Kohji; Mochizuki, Manabu; Oyama, Hajime; and Ohnuma, Teruyuki, 4,165,393, Cl. 427-18.000.
Ohsaka, Yohnosuke: *See—*
Tohzuka, Takashi; and Ohsaka, Yohnosuke, 4,165,340, Cl. 260-593.00H.
Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, to Nitto Chemical Industry Co., Ltd.; and Mitsubishi Rayon Co., Ltd. Method for preventing adhesiveness of a hydrogel of a water-soluble acrylamide-type polymer. 4,164,818, Cl. 34-12.000.
Ohshima, Iwao: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.
Ohyabu, Shuzo: *See—*
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.
Okada, Masaru: *See—*
Komiyama, Kunihiko; Kanai, Seikichi; and Okada, Masaru, 4,164,913, Cl. 123-30.00C.
Okada, Takanori: *See—*
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,165,437, Cl. 560-121.000.
Okamoto, Kikuhiko: *See—*
Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, 4,165,327, Cl. 260-397.250.
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, to Ricoh Co., Ltd. Drum cleaning system for electrophotographic apparatus. 4,165,172, Cl. 355-15.000.
Okamura, Masatoshi: *See—*
Shiba, Haruo; and Okamura, Masatoshi, 4,165,051, Cl. 242-74.100.
Okano, Takeshi; Masuyama, Tetsuo; and Yokoyama, Toshiharu, to Mitsubishi Chemical Industries, Ltd. Process for the preparation of styrene. 4,165,441, Cl. 585-444.000.
Okawa, Masahisa: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,165,298, Cl. 252-429.00B.
Okuda, Takao; and Wada, Akira, to Nippon Zeon Co. Ltd. Cyclopentadiene resin and isocyanate cured epoxy resin compositions. 4,165,344, Cl. 525-111.000.
Olan, Jose A. Combination of chair and apparel cabinets. 4,165,124, Cl. 297-190.000.
Olander, William C.; Trabold, William G.; Harvey, Douglas J.; and Vest, Robert W., to General Motors Corporation. Ignition distributor electrode for suppressing radio frequency interference. 4,165,452, Cl. 200-19.0DR.
Olechowski, Jerome R.: *See—*
Levine, Ralph; and Olechowski, Jerome R., 4,165,343, Cl. 585-638.000.
Olin Corporation: *See—*
Kadija, Igor V., 4,165,271, Cl. 204-252.000.
Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,165,432, Cl. 536-4.000.
Olsson, Rune J., to Produnik AB. Jar holder. 4,165,115, Cl. 294-27.00R.
Olympus Optical Company Limited: *See—*
Miyashita, Kiyoshi; and Kimura, Katsuhiko, 4,165,169, Cl. 355-3.0DR.
Onda, Isao, to Ageo Industries Co., Ltd. Juvenile toy vehicle. 4,165,094, Cl. 280-261.000.
Ondetti, Miguel A.; and Condon, Michael E., to E. R. Squibb & Sons, Inc. Amino acid derivatives. 4,165,320, Cl. 260-326.12R.
Ong, Kian K., to U.S. Philips Corporation. Non-linear digital to analog conversion by intermediate conversion to time interval. 4,165,507, Cl. 340-347.0DA.
Onnenberg, Volker: *See—*
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.
Ono Pharmaceutical Company, Ltd.: *See—*
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Ono, Satoru: *See—*
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Onoue, Keiji: *See—*
Suzuki, Yoshihisa; Ueda, Shozo; Taniguchi, Toshinori; and Onoue, Keiji, 4,165,046, Cl. 242-35.50A.
Orion Machinery and Engineering Corporation: *See—*
Steinhilber, Wilhelm A., 4,164,859, Cl. 72-289.000.
Osaka Soda Co. Ltd.: *See—*
Matoba, Yasuo; Hashimoto, Akira; and Sugahara, Mikio, 4,165,416, Cl. 525-346.000.
Osborne, Edward L., to Westvaco Corporation. Short depth returnable bottle container. 4,165,031, Cl. 229-34.00R.

Oshima, Saburo: *See*—
Kimata, Kei; Nakazeki, Tsugito; and Oshima, Saburo, 4,164,923, Cl. 123-140.0MC.
Osipov, Avgust V.: *See*—
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.
Ost, Robert J.; and Perry, Robert F., to Sperry Rand Corporation. Circuit integrity tester. 4,165,270, Cl. 204-195.00R.
Oswalt, Leon M.; and McClanahan, Jimmie D., to Cato Oil and Grease Co. Bulk shipping container. 4,165,024, Cl. 222-105.000.
Otani, Hisao: *See*—
Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, 4,164,818, Cl. 34-12.000.
Otis Engineering Corporation: *See*—
Arendt, Henry P.; Deaton, Thomas M.; and Dooley, Donald L., 4,164,977, Cl. 166-125.000.
Otto, Carl L., Jr., deceased; and by Lockwood, Phyllis, executrix. Multi-stage pump. 4,165,205, Cl. 417-262.000.
Ouellette, Charles W., to Raytheon Company. Multiple buoy launcher. 4,164,887, Cl. 89-1.50R.
Owen, Hugh J., to National Seating Company. Slipover headrest pillow assembly. 4,165,125, Cl. 297-220.000.
Owens-Illinois, Inc.: *See*—
Doherty, Thomas E., 4,165,028, Cl. 226-4.000.
Heider, James E., 4,165,356, Cl. 264-519.000.
Mueller, Martin, 4,164,997, Cl. 198-427.000.
Oyama, Hajime: *See*—
Suzuki, Kohji; Mochizuki, Manabu; Oyama, Hajime; and Ohnuma, Teruyuki, 4,165,393, Cl. 427-18.000.
Oyama, Kiyotaka: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.
P. Ferrero & C. S.p.A.: *See*—
Dogliotti, Amilcare, 4,165,456, Cl. 219-449.000.
Paepke, Horst. Positive feed. 4,165,048, Cl. 242-47.010.
Paice, Derek A., to Electric Power Research Institute, Inc. Current limiting circuit arrangement. 4,165,527, Cl. 361-113.000.
Paivanas, John A.: *See*—
Hassan, Javathu K.; and Paivanas, John A., 4,165,132, Cl. 406-10.000.
Pako Corporation: *See*—
Laska, Ronald C.; and Pierce, Wayne R., 4,165,176, Cl. 355-68.000.
Palmer, Harold. Garden implement. 4,164,984, Cl. 172-371.000.
Palumbo, Nunzio, to Kohner, Inc. Action toy. 4,164,827, Cl. 46-119.000.
Paniccia, Albert E.: *See*—
Howe, Leland D., Jr.; Paniccia, Albert E.; and Scotto, Vincent A., 4,165,490, Cl. 328-60.000.
Parnell, John V., III: *See*—
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Pasqualucci, Carmine: *See*—
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,165,317, Cl. 260-239.30P.
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, to Societe Nationale des Poudres et Explosifs. Poly-(carbonate-urethane)-triols and preparation thereof. 4,165,423, Cl. 528-370.000.
Patel, Jitendra G.: *See*—
Bugajski, Frank H.; and Patel, Jitendra G., 4,165,260, Cl. 201-40.000.
Pathak, Ramjee: *See*—
Sarnes, Myron C.; and Pathak, Ramjee, 4,165,243, Cl. 148-16.500.
Patrylow, Michael F.: *See*—
Stueben, Kenneth C.; Azrak, Raymond G.; and Patrylow, Michael F., 4,165,266, Cl. 204-159.150.
Patton, John T., Jr.: *See*—
Narayan, Thirumurti; Patton, John T., Jr.; Cenker, Moses; and Wulff, Harald P., 4,165,414, Cl. 521-129.000.
Patton, William F. Medical pressure gauge and indicator device. 4,164,938, Cl. 128-716.000.
Paul, Henry N., III, to Thiokol Corporation. Zinc oxide cured polysulfide polymers containing levulinic acid suitable for hot melt application. 4,165,426, Cl. 528-374.000.
Paulstra: *See*—
Casse, Christian, 4,165,113, Cl. 293-121.000.
Payne, Robert D., to Continental Group, Inc., The. Pneumatic powder flow diverting device. 4,165,134, Cl. 406-1.000.
Pedersen, S. Erik, to Atlantic Richfield Company. Preparation of a single phase vanadium (IV) bis (metaphosphate) oxidation catalyst with an improved surface area. 4,165,299, Cl. 252-435.000.
Pegg, John C.; and Walker, Clive R., to Thorn Electrical Industries Limited. Discharge lamp with starter circuit. 4,165,475, Cl. 315-99.000.
Pejchal, Karel; and Tholander, Lars H. G., to AB IRO. Thread storage and delivery apparatus. 4,165,049, Cl. 242-47.010.
Pekar, Howard G.: *See*—
Kelly, Roger A.; and Pekar, Howard G., 4,165,242, Cl. 148-6.15Z.
Peluso, Andrew, Jr.: *See*—
Esposito, Joseph, Jr.; and Peluso, Andrew, Jr., 4,164,968, Cl. 150-1.000.
Pennicott, H.: *See*—
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Peppel, Jon H., to Clark Equipment Company. Downshift inhibitor circuit. 4,164,876, Cl. 74-336.00R.
Perkin-Elmer Corporation, The: *See*—
Hall, Lawrence G.; and Loveland, Robert S., 4,164,865, Cl. 73-194.00A.
Perry, Robert F.: *See*—
Ost, Robert J.; and Perry, Robert F., 4,165,270, Cl. 204-195.00R.
Persha, Thomas J.; Lehto, Eino M.; Dueck, Richard; and Hechimovich, Nick, to Bell & Howell Company. Lamp assembly and power module for fanless microfiche reader. 4,165,160, Cl. 353-55.000.
Persson, Stig, to SKF Industries, Inc. Foamed plastic lubricating seal. 4,165,085, Cl. 277-228.000.
Peterson, Carl R., to United States of America, Interior. Rotary jaw crusher. 4,165,042, Cl. 241-198.00A.
Peterson, Dean M., to Honeywell Inc. Recording apparatus. 4,165,512, Cl. 346-24.000.
Pfendler, Thomas: *See*—
Wocher, Berthold; Pfitzmaier, Heinz; and Pfendler, Thomas, 4,165,511, Cl. 343-7.0VM.
Pfitzmaier, Heinz: *See*—
Wocher, Berthold; Pfitzmaier, Heinz; and Pfendler, Thomas, 4,165,511, Cl. 343-7.0VM.
Pfizer Inc.: *See*—
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,165,323, Cl. 260-345.200.
Phelps Dodge Corporation: *See*—
Satchell, Donald P., Jr., 4,165,264, Cl. 204-106.000.
Philibert, Daniel: *See*—
Bardoneschi, Roland; Jouquey, Alain; and Philibert, Daniel, 4,165,326, Cl. 260-397.500.
Philip Morris Incorporated: *See*—
Markwood, Robert E., 4,165,012, Cl. 220-71.000.
Phillips, Clarence A. L.: *See*—
Gravrok, Ralph E.; and Phillips, Clarence A. L., 4,165,230, Cl. 71-127.000.
Phillips Petroleum Company: *See*—
Borenstein, David E.; and Banning, Jack A., 4,164,841, Cl. 57-350.000.
Gragson, James T., 4,165,291, Cl. 252-33.000.
Piatscheck, Michael; and Sievers, Dieter. Device for storing valuables. 4,164,907, Cl. 109-50.000.
Pierce, Donald C. Cardboard picture mat with colored surface areas. 4,165,408, Cl. 428-452.000.
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Misawa, Akira, 4,165,500, Cl. 334-86.000.
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Land, Edwin H., 4,165,153, Cl. 350-126.000.
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Hoselton, Harry, 4,165,020, Cl. 220-306.000.
Poncy, George W. Tear-tab sterile thermometer sheath. 4,165,000, Cl. 206-306.000.
Popovich, Mark, to Fair Equipment Company, Inc. Fishing game device. 4,165,075, Cl. 273-140.000.
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Fielding, Ivor R.; Poppe, Wassily; and Slama, Francis J., 4,165,309, Cl. 260-45.80A.
Postma, Randall F. Method and apparatus for installing a dock. 4,165,197, Cl. 405-218.000.
Powers, Dale R., to Corning Glass Works. Method of making dry optical waveguides. 4,165,223, Cl. 65-2.000.
Pozuelo, Jose. Method of pharmacologically treating schizophrenia with alpha-methyl-para-tyrosine. 4,165,382, Cl. 424-319.000.
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Cunningham, Hugh, 4,165,272, Cl. 204-282.000.
Darlington, William B.; Driskill, John D.; and Du Bois, Donald W., 4,165,248, Cl. 156-308.000.
Pratt, Hugh W.: *See*—
Scordato, Emil A.; and Pratt, Hugh W., 4,164,870, Cl. 73-425.600.
Pratt Manufacturing Corp.: *See*—
Todd, Henry E., 4,164,833, Cl. 53-545.000.
Preiss, Georg: *See*—
Dubs, Walter; and Preiss, Georg, 4,165,402, Cl. 428-64.000.
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Pribyl, George E.: *See*—
Kantar, Anthony M.; and Pribyl, George E., 4,164,875, Cl. 73-812.000.
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Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.
Price Brothers Company: *See*—
Himes, Herman C.; and Koepnich, John P., 4,165,215, Cl. 425-169.000.

Price, Raymond M.: *See—*
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Procter & Gamble Company, The: *See—*
Gosselink, Eugene P.; Richmond, James M.; and Wentler, George E., 4,165,334, Cl. 260-458.00R.
Johnson, Samuel M.; and Hiland, Emelyn L., 4,165,290, Cl. 252-8.800.
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Belfort, Gerard L. A., 4,165,297, Cl. 252-429.00R.
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Olsson, Rune J., 4,165,115, Cl. 294-27.00R.
Prolabo: *See—*
Guillemin, Claude; and Mayen, Christian, 4,165,284, Cl. 210-198.00C.
Puhak, Peter G., to GTE Sylvania Incorporated. Electron tube socket securing means. 4,165,143, Cl. 339-75.00T.
Pullman Incorporated: *See—*
Glassmeyer, John J., 4,165,086, Cl. 280-5.00R.
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Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,889, Cl. 89-7.000.
Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,890, Cl. 89-185.000.
Pye, E. Kendall; Maciag, Thomas; Weibel, Michael K.; and Iyengar, Melicote R., to University of Pennsylvania. Plasminogen activating enzyme-specific competitive inhibitor. 4,165,258, Cl. 435-215.000.
Qasim, Javed; and McJones, Robert W., to Aerojet-General Corporation. Linear retractable seal valve. 4,165,063, Cl. 251-168.000.
Quehl, Henry E., to Du Pont de Nemours, E. I., and Company. Process for producing laminates of fabric and fluorocarbon copolymer. 4,165,404, Cl. 428-212.000.
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Strahs, Martin P., 4,164,800, Cl. 15-119.00R.
Quinby, James D. Dental cleaning and massaging apparatus. 4,164,940, Cl. 128-62.00A.
Quinn, Ronald J.: *See—*
Gregson, Richard P.; and Quinn, Ronald J., 4,165,427, Cl. 536-24.000.
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Kelly, Roger A.; and Pekar, Howard G., 4,165,242, Cl. 148-6.15Z.
Rabe, Hansjurgen: *See—*
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.
RACI S.p.A.: *See—*
Zanichelli, Gianni, 4,165,111, Cl. 285-419.000.
Ragsdale, Charles W., to Cavitron Corporation. System and method for analyzing tonosignals. 4,164,863, Cl. 128-652.000.
Raine, Paul R.; and Westcott, Lawrence, to Wiggins Teape Limited. Pressure-sensitive copying paper. 4,165,398, Cl. 427-150.000.
Ransburg Corporation: *See—*
Bentley, Stanley L.; and Jessup, David G., 4,165,022, Cl. 222-76.000.
Rau, Jim L.: *See—*
Goff, Raymon L.; and Rau, Jim L., 4,164,892, Cl. 91-375.00A.
Rauma-Repola Oy: *See—*
Jokinen, Olli, 4,165,005, Cl. 212-145.000.
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Raytheon Company: *See—*
Ouellette, Charles W., 4,164,887, Cl. 89-1.50R.
RB Toy Development Co.: *See—*
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RCA Corporation: *See—*
Calamari, James A., Jr., 4,165,396, Cl. 427-64.000.
Curtice, Walter R., 4,165,459, Cl. 235-92.0TF.
Nubani, Jawdat I.; and Muenkel, Raymond L., 4,165,227, Cl. 65-56.000.
Recaro GmbH & Co.: *See—*
Strien, Werner; Zwanziger, Rudolph; and Kaufmann, Ernst, 4,165,126, Cl. 297-284.000.
Reed, Peter, executor: *See—*
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Regal China Corporation: *See—*
Greenberg, Jerome S., 4,165,350, Cl. 264-60.000.
Reichle, Walter T., to Union Carbide Corporation. Catalytic aldol condensations. 4,165,339, Cl. 260-586.00C.
Reinke, Friedhelm; and Emde, Friedhelm, to Aeg-Elotherm, G.m.b.H. Process for the heat treatment of thick walled steel pipes. 4,165,246, Cl. 148-150.000.
Remedi, James J., to Motorola, Inc. CMOS Decoder. 4,165,504, Cl. 340-167.00R.
Rempel, William D., to Sycor, Inc. Ribbon mask and guide for dot matrix impact printers. 4,165,188, Cl. 400-124.000.
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Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,165,488, Cl. 325-321.000.
Rens, Johannes N. M.: *See—*
Henstra, Rauke; van der Kley, Tonny; and Rens, Johannes N. M., 4,165,261, Cl. 202-241.000.
Rescon Corporation, The: *See—*
Meagher, Richard R., 4,165,002, Cl. 206-459.000.
Research Corporation: *See—*
Mazzocchi, Paul H.; and Harrison, Aline M., 4,165,371, Cl. 424-244.000.
Reyes, Renato D., to Westinghouse Electric Corp. Pulley system including emergency locking means for nuclear reactor vessel inspection apparatus. 4,165,254, Cl. 176-19.00R.
Reynolds, Richard N., Jr., to Chevron Research Company. Alkylation of aniline with a lactone in the presence of water. 4,165,322, Cl. 260-343.600.
Reynolds, Victor R., to Engelhard Minerals & Chemicals Corporation. Hydrometallurgical processing of molybdenite ore concentrates. 4,165,362, Cl. 423-53.000.
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Ricciuti, Gaetano: *See—*
Zurawin, Adam; and Ricciuti, Gaetano, 4,164,803, Cl. 15-257.050.
Rice, Max. Torsion and gripping type exercise device for total arm development. 4,165,070, Cl. 272-68.000.
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Di Domenico, Mauro, Jr.; Karr, Michael A., III; and Rich, Theodore C., 4,165,496, Cl. 331-94.50S.
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Richmond, James M.: *See—*
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Ricoh Co., Ltd.: *See—*
Ishima, Kazumi, 4,165,514, Cl. 346-155.000.
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, 4,165,172, Cl. 355-15.000.
Suzuki, Kohji; Mochizuki, Manabu; Oyama, Hajime; and Ohnuma, Teruyuki, 4,165,393, Cl. 427-18.000.
Suzuki, Takami; and Iwata, Nobuo, 4,165,190, Cl. 400-144.200.
Riegel Textile Corporation: *See—*
Teed, Richard K.; and Freeman, Ernest A., Jr., 4,165,288, Cl. 210-23.00H.
Riker Laboratories, Inc.: *See—*
Moore, George G. I.; and Sell, Donald M., 4,165,383, Cl. 424-331.000.
Rinehart, Verne R., to Goodyear Tire & Rubber Company, The. Solid state polymerization of polyester prepolymer. 4,165,420, Cl. 526-63.000.
Ritter, Ernst: *See—*
Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, 4,164,925, Cl. 123-140.00R.
Ritterwerk GmbH: *See—*
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Eheim, Franz; and Hofer, Gerald, 4,164,922, Cl. 123-139.0AQ.
Hofer, Gerald; and Eheim, Franz, 4,164,921, Cl. 123-139.0AF.
Latzina, Kurt; Martin, Hans; and Wolf, Richard, 4,165,203, Cl. 415-113.000.
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Wocher, Berthold; Pfitzmaier, Heinz; and Pfendler, Thomas, 4,165,511, Cl. 343-7.0VM.
Roberts Company: *See—*
Chilpan, Kurt C.; and Lewis, William L., 4,164,840, Cl. 57-313.000.
Robertshaw Controls Company: *See—*
Asbill, Clarence M., III, 4,165,139, Cl. 339-15.000.
Rogers, Arden D., Jr.; and Goff, Clifford E., 4,165,034, Cl. 236-12.00R.
Rockwell International Corporation: *See—*
Harrington, Timothy A., 4,165,493, Cl. 330-207.00P.
Nissim, Joseph, 4,165,510, Cl. 340-754.000.
Wittry, David B., 4,165,472, Cl. 313-35.000.
Rodet, Georges: *See—*
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Rogers, Arden D., Jr.; and Goff, Clifford E., to Robertshaw Controls Company. Fluid mixing valve construction and method of making the same. 4,165,034, Cl. 236-12.00R.
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Greenfield, Stanley A.; and Dupont, John A., 4,165,318, Cl. 260-302.00A.
Rohringer, Peter: *See—*
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Roland Corporation: *See—*
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Rose, Stephen D.: *See—*
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Rosenberg, Carl S., to Lake Shore Roentgenology, Ltd. Treatment of the acute after-effects resulting from alcohol ingestion. 4,165,376, Cl. 424-267.000.
Rosendahl Industrie-Handels AG: *See—*
Seibert, Gerhard, 4,165,052, Cl. 242-78.100.
Rosenfeld, Dov: *See—*
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Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, to Archifar Laboratori Chimico Farmacologici S.p.A. Rifamycin compounds. 4,165,317, Cl. 260-239.30P.
Rottenfusser, Wolfgang: *See—*
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Rouse, Donald E., to Wiper-Mate, Inc. Detergent holder on windshield wiper arm. 4,164,802, Cl. 15-250.030.
Roussel Uclaf: *See—*
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Rubio, Diego C.: *See—*
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Ruble, Eulalia Berry, executrix: *See—*
Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,165,364, Cl. 423-456.000.
Ruble, Theodore A., deceased: *See—*
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Ruer, Jacques; and Vedda, Louis. Liquid-cooled electromagnetic continuous casting mold. 4,164,974, Cl. 164-147.000.
Ruscitti, Tomaso. Caps having frangible opening means. 4,165,014, Cl. 220-266.000.
Ryder, Francis E.: *See—*
Thomas, Michael D.; and Ryder, Francis E., 4,165,359, Cl. 422-105.000.
Ryder International Corporation: *See—*
Thomas, Michael D.; and Ryder, Francis E., 4,165,359, Cl. 422-105.000.
Sadler, Philip M. Inflatable structure. 4,164,829, Cl. 52-2.000.
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Sajben, Johannes O.: *See—*
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Sakow, Lawrence. Sink strainer assembly. 4,164,796, Cl. 4-288.000.
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., to General Foods Corporation. Process for solubilizing FD&C Red 3 under acidic conditions and composition. 4,165,390, Cl. 426-540.000.
Salk Institute for Biological Studies, The: *See—*
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Salling, Per: *See—*
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Salomon, Georges P. J., to Establissements Francois Salomon et Fils. Device for measuring a human foot. 4,164,815, Cl. 33-3.00A.
Samuelsson, Gustav B. R.: *See—*
Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Aberg, Axel K. G., 4,165,384, Cl. 424-324.000.
Sandelli, Gregory J., to United Technologies Corporation. Method for fabricating a ribbed electrode substrate. 4,165,349, Cl. 264-29.100.
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Avar, Lajos; and Hofer, Kurt, 4,165,267, Cl. 204-159.150.
Moissonnier, Rene; and Seiler, Hans, 4,165,306, Cl. 260-40.00P.
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Uehlinger, Hanspeter, 4,165,314, Cl. 260-145.00A.
Sanyo Electric Co., Ltd.: *See—*
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Sarnes, Myron C.; and Pathak, Ramjee, to Federal-Mogul Corporation. Method of making selectively carburized forged powder metal parts. 4,165,243, Cl. 148-16.500.
Sasaki, Toshio: *See—*
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Satchell, Donald P., Jr., to Phelps Dodge Corporation. Ammonia leaching. 4,165,264, Cl. 204-106.000.
Sato, Ko, to Nippon Precision Optical Instrument Co., Ltd.; and Nippon S R S, Inc. Device for wiping optical window in turbidimeter or similar optical instrument for examining liquid sample. 4,165,179, Cl. 356-246.000.
Sato Kogyo Kabushiki Kaisha: *See—*
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Sato, Munetaka: *See—*
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Sawa, Kiyohiko: *See—*
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Throop, C. Terry; Moffett, Richard E.; Hemmert, John R.; and Sawyer, Robert E., Jr., 4,165,450, Cl. 179-175.20C.
Schafer, Fritz P.; and Luttke, Wolfgang, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Laser dyes comprising fluorescent and laser dyestuff residues. 4,165,434, Cl. 544-197.000.
Schaffer, William S.: *See—*
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Scharf, Rolf: *See—*
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Schlarmann, Philip J., to Iowa Manufacturing Company of Cedar Rapids, Iowa. Apparatus for asphaltic concrete hot mix recycling. 4,165,184, Cl. 366-12.000.
Schlegel, Albert; and Wirtz, Peter, to Hoechst Aktiengesellschaft. Process for deodorizing foaming agents for the manufacture of air foams. 4,165,313, Cl. 260-123.700.
Schlereth, Fritz H.; and Morgan, Michael J., to Inficon Leybold-Heraeus Inc. Leak standard generator. 4,164,861, Cl. 73-1.00G.
Schlossman, Irwin S.; and Wiman, Robert E., to Emery Industries, Inc. Polymer compositions containing poly (alkylene ether) esters of polybasic acids. 4,165,303, Cl. 260-22.00D.
Schlussler, Hans-Joachim: *See—*
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Schmidt, Herbert: *See—*
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Schmidt, Otomar: *See—*
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Schmit, Justin M. Fluid containing and dispensing structure having a deformable flexible wall portion. 4,165,023, Cl. 222-105.000.
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Schneider, Ronald A., to Chevron Research Company. Synthesis of acrylic acids and esters. 4,165,438, Cl. 560-211.000.
Schoenenberger, Guido A., to Hoffmann-La Roche Inc. Phosphorylated nonapeptides, processes for the preparation thereof and pharmaceutical compositions containing them. 4,165,312, Cl. 260-112.50R.
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Schreiber, William L.: *See—*
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Schroder, Rolf: *See—*
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Schroeder, Hobe; and Kulpa, Stanley J., to Standard Oil Company (Indiana). Removal of phthalide from impure phthalic anhydride. 4,165,324, Cl. 260-346.700.
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Schwartz, Reinhard: *See—*
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Schwartz, Sidney J.: *See—*
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Schwarz, Rudolf: *See—*
Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, 4,165,363, Cl. 423-342.000.
Schweitzer, Edmund O., Jr. Fault indicator and means for resetting same. 4,165,528, Cl. 361-156.000.
Schweizer, Udo P., to Akzona Incorporated. Yarn process. 4,164,839, Cl. 57-293.000.
Scordato, Emil A.; and Pratt, Hugh W., to Medical Laboratory Automation, Inc. Pipettes. 4,164,870, Cl. 73-425.600.
Scott, Harold W., to Winton Corporation. Oil extraction method. 4,164,978, Cl. 166-249.000.
Scotto, Vincent A.: *See—*
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Sefton, Robert H.; and Carlson, John D., to Koppers Company, Inc. Process for producing phenolic foams with a uniform appearance. 4,165,413, Cl. 521-128.000.
Seibert, Gerhard, to Rosendahl Industrie-Handels AG. Apparatus for winding or unwinding of a cord-shaped winding material. 4,165,052, Cl. 242-78.100.
Seiler, Hans: *See—*
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Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
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Sell, Donald M.: *See—*
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Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., to Texaco Inc. Control system for a furfural refining unit receiving heavy sour charge oil. 4,165,259, Cl. 196-14.520.
Serlin, Irving, to Monsanto Company. Coating compositions comprising polymer blends containing polystyrene or poly(α-methyl styrene). 4,165,308, Cl. 260-42.520.
Serrano, Francisco de Assis M., to Compagnie Generale pour les Developpements Operationnels des Richesses Sous Marines "C.G. Doris". Method of constructing a column formed from annular elements and elements for the application of said method. 4,165,196, Cl. 405-205.000.
Shaler, Amos J.; and McLean, Daniel C. Hair curler system. 4,164,951, Cl. 132-31.00R.
Shankle, Arthur T.: *See—*
Cain, Charles J.; and Shankle, Arthur T., 4,165,505, Cl. 340-200.000.
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal. Method of unloading bulk materials from vessels and device for implementing same. 4,165,135, Cl. 406-152.000.
Shell Oil Company: *See—*
Kim, Leo, 4,165,440, Cl. 568-867.000.
Kwant, Pieter B., 4,165,274, Cl. 208-93.000.
Shelton, Donald G.: *See—*
Kulhavy, Joseph T.; and Shelton, Donald G., 4,164,915, Cl. 123-32.00R.
Shepard, Inella G.: *See—*
Graham, William H.; and Shepard, Inella G., 4,165,421, Cl. 528-75.000.
Shiba, Haruo; and Okamura, Masatoshi, to TDK Electronics Co., Ltd. Tape reel. 4,165,051, Cl. 242-74.100.
Shiba, Keisuke; Tajima, Tatsuya; and Sakaki, Hirokazu, to Fuji Photo Film Co., Ltd. Silver halide light-sensitive material. 4,165,237, Cl. 96-76.00R.
Shibata, Fumio: *See—*
Kitamura, Kazuo; Takabayashi, Fumiki; Shibata, Fumio; Watabe, Kaname; and Azumi, Toshinori, 4,165,217, Cl. 8-81.000.
Shibuya, Yukio: *See—*
Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, 4,164,818, Cl. 34-12.000.
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.
Shida, Seiji: *See—*
Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, 4,165,281, Cl. 210-17.000.
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, to Sumitomo Chemical Company, Limited. Catalysts for the polymerization of olefins. 4,165,298, Cl. 252-429.00B.
Shinkai, Hiroyuki: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.
Shiozawa, Etsuo: *See—*
Matsumoto, Nobuo; Tsuji, Osami; Kamiya, Yukio; and Shiozawa, Etsuo, 4,165,251, Cl. 156-584.000.
Shiraishi, Hiroshi: *See—*
Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraishi, Hiroshi; and Nakamura, Takato, 4,165,341, Cl. 260-600.00R.
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, to Sumitomo Electric Industries, Ltd. Process for producing optical transmission fiber. 4,165,152, Cl. 350-96.300.
Shirose, Toshihiro: *See—*
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,165,369, Cl. 424-70.000.
Shu, Chi-Kuen: *See—*
Wiegers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., 4,165,301, Cl. 252-522.000.
Sid Richardson Carbon & Gasoline Co.: *See—*
Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,165,364, Cl. 423-456.000.
Siemens Aktiengesellschaft: *See—*
Auracher, Franz; and Kersten, Ralf, 4,165,225, Cl. 65-4.00B.
Heywang, Walter, 4,164,811, Cl. 29-628.000.
Heywang, Walter, 4,165,249, Cl. 156-605.000.
Kobale, Manfred; and Krueger, Hans, 4,165,157, Cl. 350-343.000.
Vanhumbeeck, Jacky; and Vandenbossche, Christiaan, 4,165,218, Cl. 23-230.00R.
Weigl, Karlheinz, 4,164,872, Cl. 73-510.000.
Sievers, Dieter: *See—*
Piatscheck, Michael; and Sievers, Dieter, 4,164,907, Cl. 109-50.000.
Silonics, Inc.: *See—*
Mitchell, Charles S., 4,165,029, Cl. 226-25.000.
Sincerbox, Glenn T.: *See—*
Gordon, Joseph G., II; and Sincerbox, Glenn T., 4,165,155, Cl. 350-285.000.
Singer Company, The: *See—*
Cook, Albert N.; Kornatowski, Boleslaw; and Tyburcy, Raymond S., 4,165,144, Cl. 339-88.00R.
Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.
Singer, Hans S. Strand tensioning device and method. 4,165,056, Cl. 242-151.000.
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., to Kearney & Trecker Corporation. Automatic tool changer for machine tool. 4,164,810, Cl. 29-568.000.
Siuta, Gerald J.: *See—*
Weiss, Martin J.; and Siuta, Gerald J., 4,165,331, Cl. 260-448.80R.
SKF Industries, Inc.: *See—*
Persson, Stig, 4,165,085, Cl. 277-228.000.
Sklarz, William A.: *See—*
Epstein, Albert; Graham, Glen; and Sklarz, William A., 4,165,250, Cl. 435-267.000.
Slama, Francis J.: *See—*
Fielding, Ivor R.; Poppe, Wassily; and Slama, Francis J., 4,165,309, Cl. 260-45.80A.
Smarock, Walter H.: *See—*
Spector, Myron; Kwiatkowski, George T.; Smarock, Walter H.; and Michno, Michael J., Jr., 4,164,794, Cl. 3-1.912.
Smith, Arthur R., to Wildt Mellor Bromley Ltd. Yarn end collection. 4,164,856, Cl. 66-140.00R.
Smith, Herman W., to Upjohn Company, The. 11-Deoxy-trans-4,5,13,14-tetradehydro-PGI_1 compounds. 4,165,325, Cl. 260-346.220.
Smith, Oliver W.; and Koleske, Joseph V., to Union Carbide Corporation. High solids coating compositions. 4,165,345, Cl. 525-419.000.
Smith, William E., to General Electric Company. Process for the selective ortho-alkylation of a phenol in the presence of a copper-chromium catalyst. 4,165,439, Cl. 568-804.000.
SmithKline Corporation: *See—*
Brush, Charles K.; and Weinstock, Joseph, 4,165,372, Cl. 424-244.000.
Hill, David T., 4,165,380, Cl. 424-290.000.
Snader, Kenneth M., 4,165,365, Cl. 424-45.000.
Smulders, Walter H. M. M., to U.S. Philips Corporation. Semiconductor device and method of manufacturing same. 4,165,516, Cl. 357-34.000.
Snader, Kenneth M., to SmithKline Corporation. Substituted 2H-pyran-2,6(3H)-dione derivatives. 4,165,365, Cl. 424-45.000.
Snyder, Charles A., to Circle F Industries, Inc. Retention means for snap-in spring. 4,165,146, Cl. 339-128.000.
Societe Anonyme dite: UNELEC: *See—*
Hennemann, Jean, 4,165,453, Cl. 200-153.00G.
s.a. Texaco Belgium n.v.: *See—*
Hermans, Johny C., 4,165,424, Cl. 528-370.000.
Societe Nationale des Poudres et Explosifs: *See—*
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, 4,165,423, Cl. 528-370.000.
Societe Nationale Elf Aquitaine (Production): *See—*
de Saint-Palais, Jacques, 4,165,108, Cl. 285-45.000.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Jaunin, Jean-Pierre, 4,164,844, Cl. 58-39.500.
Soderberg, Nils-Eirk, to Stal-Laval Turbin AB. Control valve for parallel flows. 4,164,962, Cl. 137-862.000.
Solar Apparatus & Equipment Limited: *See—*
Marles, Kevin C.; and Spencer, Brian W., 4,164,935, Cl. 126-447.000.
Somlo, Tibor: *See—*
Marti, Franz; Somlo, Tibor; and Gosteli, Jacques, 4,165,268, Cl. 204-163.00R.
Sommer, Helmut: *See—*
Kohler, Hans W.; and Sommer, Helmut, 4,164,905, Cl. 102-212.000.
Sony Corporation: *See—*
Hirai, Jun, 4,165,518, Cl. 358-8.000.
Hongu, Masayuki, 4,165,498, Cl. 333-144.000.
Ninomiya, Takeshi, 4,165,524, Cl. 360-36.000.
Takahashi, Hiroo, 4,165,495, Cl. 330-283.000.
Watanabe, Yoshimi, 4,165,521, Cl. 360-10.000.
Sorbier, Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and apparatus for molding articles from agglomerated particles. 4,165,353, Cl. 264-120.000.
Sorensen, Jorgen A.: *See—*
von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., 4,165,387, Cl. 426-16.000.
Sorokin, Vasily I.: *See—*
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.
Sowden, George J., to I Guzzini S.P.A. Articulated-arm supporting member, especially for lamps. 4,165,530, Cl. 362-401.000.
Speakman, Derek N. A., to Imperial Chemical Industries Limited. Paint manufacture. 4,165,418, Cl. 525-377.000.
Spector, Myron; Kwiatkowski, George T.; Smarock, Walter H.; and Michno, Michael J., Jr., to Union Carbide Corporation. Prosthetic devices having coatings of selected porous bioengineering thermoplastics. 4,164,794, Cl. 3-1.912.
Spencer, Brian W.: *See—*
Marles, Kevin C.; and Spencer, Brian W., 4,164,935, Cl. 126-447.000.
Spencer, William E. Equipment for detecting, monitoring, measuring, displaying and recording pulse and heartbeat. 4,164,937, Cl. 128-666.000.
Sperry Rand Corporation: *See—*
Geffon, Arthur P., 4,165,491, Cl. 328-150.000.
Ost, Robert J.; and Perry, Robert F., 4,165,270, Cl. 204-195.00R.

Sporri, Heinz: *See—*
Beringer, Monique; and Sporri, Heinz, 4,164,948, Cl. 131-140.00C.

Square D Company: *See—*
Andersen, Paul R., 4,165,502, Cl. 335-39.000.
Campbell, Paul K.; and Nichols, Edward L., III, 4,165,148, Cl. 339-276.00R.

Stal-Laval Turbin AB: *See—*
Soderberg, Nils-Eirk, 4,164,962, Cl. 137-862.000.

Standard Oil Company, The: *See—*
Dolhyj, Serge R.; and Milberger, Ernest C., 4,165,300, Cl. 252-462.000.

Standard Oil Company (Indiana): *See—*
Fielding, Ivor R.; Poppe, Wassily; and Slama, Francis J., 4,165,309, Cl. 260-45.80A.
Schroeder, Hobe; and Kulpa, Stanley J., 4,165,324, Cl. 260-346.700.

Standun, Inc.: *See—*
Kaminskas, Rimvydas A., 4,164,860, Cl. 72-345.000.

Stanley, Robert E.: *See—*
Alley, Lawrence E., III; Lydick, Richard P.; and Stanley, Robert E., 4,164,944, Cl. 128-419.0PG.

Stanton, Garth M.: *See—*
Dreher, John L.; and Stanton, Garth M., 4,165,329, Cl. 260-404.500.

Stapley, Edward O.: *See—*
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.

Stauffer Chemical Company: *See—*
Corbett nee Rolison, Constance R., 4,165,391, Cl. 426-580.000.

Steck, Werner: *See—*
Jaeckh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.

Stedman, Robert N., to Caterpillar Tractor Co. Apex track shoe and method for making the same. 4,165,137, Cl. 305-54.000.

Steensen, Wayne L.: *See—*
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,165,390, Cl. 426-540.000.

Steinbach, Thomas M., to TRW Inc. Ribbon connector constructions. 4,165,145, Cl. 339-91.00R.

Steinhilber, Wilhelm A., to Orion Machinery and Engineering Corporation. Wire accumulator. 4,164,859, Cl. 72-289.000.

Steinke, Kurt E.: *See—*
Holdren, Fred V.; Hulsing, Rand H., II; and Steinke, Kurt E., 4,165,483, Cl. 324-60.00C.

Steraplast, Inc.: *See—*
Knopick, Robert A.; and Morlock, Allen B., 4,164,941, Cl. 128-132.00D.

Sternberg, Hans J. Duplicating postcard form. 4,165,101, Cl. 282-27.500.

Stevens, David K.: *See—*
DeGood, David A.; and Stevens, David K., 4,164,998, Cl. 198-781.000.

Stewart, Bruce E.: *See—*
Lyman, John B.; and Stewart, Bruce E., 4,165,140, Cl. 339-15.000.

Stiefel, Christian; and Frederich, Fritz, to Waggonfabrik Uerdingen Aktiengesellschaft. Passenger evacuation apparatus. 4,164,990, Cl. 182-48.000.

Stikkers, Tieme C., to Dayco Corporation. Drive apparatus for vehicle mounted generator. 4,165,466, Cl. 290-3.000.

Stokke, Olaf M., to Continental Oil Company. Biopolymer filterability improvement by caustic-enzyme treatment. 4,165,257, Cl. 435-262.000.

Stolyarova, Ljudmila I.: *See—*
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Stolzer, Paul, to Keuro GmbH & Co., KG. Device for clamping a workpiece. 4,165,068, Cl. 269-136.000.

Stone, W. Norman; and Allmansberger, Robert A., to National Musical String Company. Method for attaching an end bead to a musical instrument string. 4,164,806, Cl. 29-517.000.

Storage Technology Corporation: *See—*
Vachon, Patrick A., 4,165,449, Cl. 179-170.200.

Strahs, Martin P., to Quickie Manufacturing Corp. Combination mop and wringer. 4,164,800, Cl. 15-119.00R.

Strand, Norman S., to Federal Screw Works. Threaded fastener product with adhesive coating. 4,164,971, Cl. 151-14.500.

Strehler, Hugo; Dietl, Ernst; and Pilz, Georg, to BASF Aktiengesellschaft. Salts of dicarboxylic acids and diamines, having an improved color number, their manufacture and their use. 4,165,335, Cl. 260-501.200.

Strien, Werner; Zwanziger, Rudolph; and Kaufmann, Ernst, to Recaro GmbH & Co. Adjustable vehicle seat bottom. 4,165,126, Cl. 297-284.000.

Strowick, Willibald; and Werner, Paul, to Keiper Automobiltechnik GmbH & Co. KG. Inertially locked hinge for motor-vehicle seat. 4,165,128, Cl. 297-367.000.

Stubben, David R., to Atari, Inc. Method of operating a video game. 4,165,072, Cl. 273-85.00G.

Stueben, Kenneth C.; Azrak, Raymond G.; and Patrylow, Michael F., to Union Carbide Corporation. Radiation curable pressure sensitive adhesive compositions. 4,165,266, Cl. 204-159.150.

Sugahara, Mikio: *See—*
Matoba, Yasuo; Hashimoto, Akira; and Sugahara, Mikio, 4,165,416, Cl. 525-346.000.

Sugie, Toshinori: *See—*
Mizuno, Shioji; and Sugie, Toshinori, 4,165,307, Cl. 260-40.0TN.

Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Sato Kogyo Kabushiki Kaisha. Shield tunneling machine and method. 4,165,129, Cl. 299-11.000.

Sulzer Brothers Limited: *See—*
Ludwig, Alfred, 4,165,245, Cl. 148-127.000.

Sumitomo Chemical Company, Limited: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,165,298, Cl. 252-429.00B.
Yamada, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,165,373, Cl. 424-246.000.

Sumitomo Electric Industries, Ltd.: *See—*
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,165,152, Cl. 350-96.300.

Summer, James R., to American Safety Equipment Corporation. Float assembly for a helicopter or the like. 4,165,059, Cl. 244-100.00A.

Sun Oil Company of Pennsylvania: *See—*
Thompson, Robert M., 4,165,346, Cl. 525-432.000.

Sundie, Richard D.; and Michael, William R., to Allied Chemical Corporation. Two-component binder for exterior fiberboard. 4,165,305, Cl. 260-29.40R.

Sundstrand Data Control, Inc.: *See—*
Holdren, Fred V.; Hulsing, Rand H., II; and Steinke, Kurt E., 4,165,483, Cl. 324-60.00C.

Suntola, Tuomo S., to Vaisala Oy. Capacitive humidity transducer. 4,164,868, Cl. 73-336.500.

Sutton, Gordon W.: *See—*
Beacham, Bryan; and Sutton, Gordon W., 4,165,040, Cl. 239-600.000.

Suzki, Akiyoshi; and Hirabayashi, Yoichi, to Canon Kabushiki Kaisha. Device for scanning an object with a light beam. 4,165,149, Cl. 350-6.100.

Suzuki, Kohji; Mochizuki, Manabu; Oyama, Hajime; and Ohnuma, Teruyuki, to Ricoh Co., Ltd. Magnetic brush developing process for electrostatic images. 4,165,393, Cl. 427-18.000.

Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, to Nitto Chemical Industry Co., Ltd.; Mitsubishi Rayon Co., Ltd.; and Diafloc Co., Ltd. Metal surfaces coated with aliphatic acids containing 12 carbon atoms or more to eliminate polymer build-up on reactor walls during the polymerization of water-soluble cationic polymers. 4,165,419, Cl. 526-62.000.

Suzuki, Takami; and Iwata, Nobuo, to Ricoh Co., Ltd. Serial printing apparatus. 4,165,190, Cl. 400-144.200.

Suzuki, Yoshihisa; Ueda, Shozo; Taniguchi, Toshinori; and Onoue, Keiji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Doffing apparatus in spinning machine. 4,165,046, Cl. 242-35.50A.

Swanson, Alfred B. Lunate implant. 4,164,793, Cl. 3-1.910.

Swiss Aluminium Ltd.: *See—*
Dantzig, Jonathan A.; and Tyler, Derek E., 4,165,235, Cl. 75-93.00E.

Sycor, Inc.: *See—*
Rempel, William D., 4,165,188, Cl. 400-124.000.

Tachika, Tetsuji: *See—*
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.

Tajima, Tatsuya: *See—*
Shiba, Keisuke; Tajima, Tatsuya; and Sakaki, Hirokazu, 4,165,237, Cl. 96-76.00R.

Takabayashi, Fumiki: *See—*
Kitamura, Kazuo; Takabayashi, Fumiki; Shibata, Fumio; Watabe, Kaname; and Azumi, Toshinori, 4,165,217, Cl. 8-81.000.

Takada, Juichiro, to Takata Kojyo Co., Ltd. Safety belt applying system. 4,165,100, Cl. 280-802.000.

Takahashi, Akio; and Saito, Hirokichi, to Ihara Chemical Industry Co. Ltd. Switching valves. 4,164,956, Cl. 137-242.000.

Takahashi, Haruo, to Tokyo Shibaura Electric Co., Ltd. Electronic watt-hour meter. 4,165,485, Cl. 324-142.000.

Takahashi, Hiroo, to Sony Corporation. Circuit system for reproducing a signal from a moving record carrier. 4,165,495, Cl. 330-283.000.

Takahashi, Yoshimasa, to Sanyo Electric Co., Ltd. Projection screen assembly. 4,165,154, Cl. 350-128.000.

Takamitsu, Nagaaki: *See—*
Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraishi, Hiroshi; and Nakamura, Takato, 4,165,341, Cl. 260-600.00R.

Takano, Satoshi: *See—*
Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, 4,165,327, Cl. 260-397.250.

Takata, Akira: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.0EE.

Takata Kojyo Co., Ltd.: *See—*
Takada, Juichiro, 4,165,100, Cl. 280-802.000.

Takikawa, Yujiro, to Aisin Seiki Kabushiki Kaisha. Chainstitch forming device for sewing machines. 4,164,908, Cl. 112-168.000.

Taldykin, Igor A.: *See—*
Kostyanoi, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.

Tamag Basel AG: *See*—
Beringer, Monique; and Sporri, Heinz, 4,164,948, Cl. 131-140.00C.
Tanae, Fumio; and Matsuoka, Hirokazu, to Teijin Seiki Company Limited. Bulky yarn producing apparatus. 4,164,836, Cl. 57-2.000.
Tanga, Michifumi: *See*—
Adachi, Terufumi; and Tanga, Michifumi, 4,165,415, Cl. 521-145.000.
Tani, Tatsuo: *See*—
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, 4,165,172, Cl. 355-15.000.
Taniguchi, Toshinori: *See*—
Suzuki, Yoshihisa; Ueda, Shozo; Taniguchi, Toshinori; and Onoue, Keiji, 4,165,046, Cl. 242-35.50A.
Tate, David L.: *See*—
Exley, John T.; Kuintzle, Charles, Jr.; and Tate, David L., 4,164,845, Cl. 60-39.290.
Taylor, Lyle M. Drilling and deburring apparatus. 4,165,200, Cl. 408-118.000.
TDK Electronics Co., Ltd.: *See*—
Shiba, Haruo; and Okamura, Masatoshi, 4,165,051, Cl. 242-74.100.
Teed, Richard K.; and Freeman, Ernest A., Jr., to Riegel Textile Corporation. Process of treating waste water from a textile vat dyeing operation to produce a concentrate for reuse. 4,165,288, Cl. 210-23.00H.
Teijin Limited: *See*—
Kitamura, Kazuo; Takabayashi, Fumiki; Shibata, Fumio; Watabe, Kaname; and Azumi, Toshinori, 4,165,217, Cl. 8-81.000.
Teijin Seiki Company Limited: *See*—
Tanae, Fumio; and Matsuoka, Hirokazu, 4,164,836, Cl. 57-2.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,165,488, Cl. 325-321.000.
Telefonaktiebolaget L M Ericsson: *See*—
Jonsson, Bjorn E. R., 4,165,533, Cl. 364-900.000.
Temple, Victor A. K.; and Baliga, B. Jayant, to Electric Power Research Institute, Inc. Self-protection against breakover turn-on failure in thyristors through selective base lifetime control. 4,165,517, Cl. 357-38.000.
Teramachi, Hiroshi. Recirculating ball bearing spline joint. 4,165,195, Cl. 403-359.000.
Texaco Inc.: *See*—
Gravrok, Ralph E.; and Phillips, Clarence A. L., 4,165,230, Cl. 71-127.000.
Nooner, Daryl W., 4,164,979, Cl. 166-288.000.
Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., 4,165,259, Cl. 196-14.520.
Texas Instruments Incorporated: *See*—
Myers, David J., 4,165,474, Cl. 313-500.000.
Thiokol Corporation: *See*—
Bertozzi, Eugene R., 4,165,425, Cl. 528-374.000.
Graham, William H.; and Shepard, Inella G., 4,165,421, Cl. 528-75.000.
Paul, Henry N., III, 4,165,426, Cl. 528-374.000.
Tholander, Lars H. G.: *See*—
Pejchal, Karel; and Tholander, Lars H. G., 4,165,049, Cl. 242-47.010.
Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Autoclave aseptor. 4,165,359, Cl. 422-105.000.
Thomas, Robert R., to Hopkins Manufacturing Corporation. Bear claw ice scraper. 4,164,801, Cl. 15-236.00R.
Thompson, Joseph A., to GKN Kent Alloys Limited. Cast vehicle wheels. 4,165,131, Cl. 301-65.000.
Thompson, Robert M., to Sun Oil Company of Pennsylvania. Copolymer of poly(4,7-dioxadecamethylene adipamide)-polycaprolactam containing terephthalic acid. 4,165,346, Cl. 525-432.000.
Thomson-CSF: *See*—
de Panafieu, Arnaud; Villard, Michel; Baylac, Christiane; and Favre, Michel, 4,165,222, Cl. 65-2.000.
Motola, Marcel; and Besson, Yves, 4,165,492, Cl. 328-165.000.
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Hill, J. Donald; and Fountain, Gordon H., 4,164,943, Cl. 128-348.000.
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Pegg, John C.; and Walker, Clive R., 4,165,475, Cl. 315-99.000.
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Adachi, Terufumi; and Tanga, Michifumi, 4,165,415, Cl. 521-145.000.
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Takahashi, Haruo, 4,165,485, Cl. 324-142.000.
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Kanatani, Masataka; and Awamura, Daikichi, 4,165,465, Cl. 250-559.000.
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Kendall, Thomas L.; Downing, Leo G.; and Ray, James A., 4,165,532, Cl. 364-420.000.
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Dick, Perry J., Jr., 4,165,199, Cl. 405-271.000.
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Turcotte, Gordon W., to International Telephone & Telegraph Corp. Thermostatically controlled pre-weld heater. 4,165,457, Cl. 219-516.000.
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Cook, Albert N.; Kornatowski, Boleslaw; and Tyburcy, Raymond S., 4,165,144, Cl. 339-88.00R.
Tyler, Derek E.: *See*—
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Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraishi, Hiroshi; and Nakamura, Takato, 4,165,341, Cl. 260-600.00R.
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Union Carbide Corporation: *See*—
Reichle, Walter T., 4,165,339, Cl. 260-586.00C.
Smith, Oliver W.; and Koleske, Joseph V., 4,165,345, Cl. 525-419.000.
Spector, Myron; Kwiatkowski, George T.; Smarock, Walter H.; and Michno, Michael J., Jr., 4,164,794, Cl. 3-1.912.
Stueben, Kenneth C.; Azrak, Raymond G.; and Patrylow, Michael F., 4,165,266, Cl. 204-159.150.
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Army: *See*—
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Holmes, Allen B.; and Gehman, Stacy E., 4,165,503, Cl. 340-17.00R.
Kohler, Hans W.; and Sommer, Helmut, 4,164,905, Cl. 102-212.000.
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Vilkomerson, David H. R., 4,165,182, Cl. 356-349.000.
Commerce: *See*—
Hall, John L.; and Lee, Siu Au, 4,165,183, Cl. 356-346.000.
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Rose, Stephen D.; Crouch, Charles E.; and Jones, Elborn W. Coal-rock interface detector. 4,165,460, Cl. 250-253.000.
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Beard, Charles D.; and Baum, Kurt, 4,165,332, Cl. 260-453.00R.
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Koel, Gerrit J.; and Druyvesteyn, Willem F., 4,165,525, Cl. 360-125.000.
Ong, Kian K., 4,165,507, Cl. 340-347.0DA.
Smulders, Walter H. M. M., 4,165,516, Cl. 357-34.000.
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Wells, John C.; and Back, Paul R., 4,165,481, Cl. 324-16.00T.
University of California, The Regents of the: *See*—
Kolin, Alexander, 4,164,939, Cl. 128-692.000.
Morrison, H. Frank, 4,165,480, Cl. 324-6.000.
University of Delaware: *See*—
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Pye, E. Kendall; Maciag, Thomas; Weibel, Michael K.; and Iyengar, Melicote R., 4,165,258, Cl. 435-215.000.
UOP Inc.: *See*—
Antos, George J., 4,165,276, Cl. 208-139.000.
Upjohn Company, The: *See*—
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Smith, Herman W., 4,165,325, Cl. 260-346.220.
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Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.
Vachon, Patrick A., to Storage Technology Corporation. Echo suppressor circuit. 4,165,449, Cl. 179-170.200.
Vago, Robert E., to Diakinetics, Incorporated. Therapeutic and rehabilitative carriage. 4,165,127, Cl. 297-345.000.
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Suntola, Tuomo S., 4,164,868, Cl. 73-336.500.
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Lundquist, Ingemar H., 4,165,208, Cl. 417-565.000.
Vanchot, Andre H. Snow plow blade attachment system. 4,164,821, Cl. 37-141.00R.
van den Beld, Paul C. H., to Wavin B.V. Sealed joint pipe connection. 4,165,104, Cl. 285-21.000.
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Vanhumbeeck, Jacky; and Vandenbossche, Christiaan, 4,165,218, Cl. 23-230.00R.
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Henstra, Rauke; van der Kley, Tonny; and Rens, Johannes N. M., 4,165,261, Cl. 202-241.000.
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Vander Mey, John E., to Allied Chemical Corporation. Organic stripping compositions and method for using same. 4,165,295, Cl. 252-143.000.
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Van Zandt, Alex. Tongue and groove structure in preformed wall sections. 4,164,832, Cl. 52-593.000.
Varian Associates, Inc.: *See*—
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Varshney, Ramesh C.; Venkateswaran, Kalyanasundaram; and Amelio, Gilbert F., to Fairchild Camera and Instrument Corporation. Serial-parallel-serial charge-coupled device memory having interlacing and ripple clocking of the parallel shift registers. 4,165,541, Cl. 365-219.000.
Vasilevskaya, Tatyana K.: *See*—
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.
Vasilos, Thomas, to Avco Corporation. Method for manufacture of a substantially mechanically isotropic ceramic composite structure. 4,165,355, Cl. 264-255.000.
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Varshney, Ramesh C.; Venkateswaran, Kalyanasundaram; and Amelio, Gilbert F., 4,165,541, Cl. 365-219.000.
Vest, Robert W.: *See*—
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Vetter, Arthur, to Multivac Sepp Haggenmuller KG. Method of shaping plastics foils. 4,165,357, Cl. 264-548.000.
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Hager, Jurgen; and Vieth, Walter, 4,165,045, Cl. 241-282.000.
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Virva, John J., to Admiral Corporation. Fine tuned, column speaker system. 4,164,988, Cl. 181-156.000.
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Volkman, Roy G., to James River Corp. Method of producing self-bonded, melt-blown battery separators, and resulting product. 4,165,352, Cl. 264-113.000.
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Kostyanoi, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.
von der Crone, Jost; and Frey, Christoph, to Ciba-Geigy Corporation. Isoindoline pigments. 4,165,319, Cl. 260-325.0PH.
von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., to De Forenede Bryggerier A/S. Method of brewing beer of improved stability. 4,165,387, Cl. 426-16.000.
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Marans, Nelson S.; Kehr, Clifton L.; and Murch, Robert M., 4,165,411, Cl. 521-107.000.
Wada, Akira: *See*—
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Wagner, David A., to Chrysler Corporation. Rear suspension apparatus for a motor vehicle. 4,165,098, Cl. 280-708.000.
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Bergman, John G., Jr.; Jain, Ravinder K.; and Wagner, Sigurd, 4,165,515, Cl. 357-6.000.
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Walker, Thomas G., to JDS Products, Inc. Conduit bending level. 4,164,817, Cl. 33-371.000.
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Wardleworth, James M.: *See*—
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Watanabe, Yoshimi, to Sony Corporation. Video signal reproducing system with moveable head for slow or stop tracking control. 4,165,521, Cl. 360-10.000.

Wavin B.V.: *See—*
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Jardin, Hans; Rottenfusser, Wolfgang; and Isleif, Karl-Heinz, 4,165,120, Cl. 296-137.00J.

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Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of chlorosilanes. 4,165,363, Cl. 423-342.000.

Weigl, Karlheinz, to Siemens Aktiengesellschaft. Method for determining spinning or slipping of the wheels in propulsion vehicles without dead axles. 4,164,872, Cl. 73-510.000.

Weinert, Harry F.: *See—*
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Weinstock, Joseph: *See—*
Brush, Charles K.; and Weinstock, Joseph, 4,165,372, Cl. 424-244.000.

Weiser, Earnest F., to General Electric Company. Low loss, resettable excitation control for an inductive load. 4,165,476, Cl. 318-493.000.

Weiss, Martin J.; and Siuta, Gerald J., to American Cyanamid Company. 11-(2-Hydroxyethylthio)prostenoic acid E series derivatives. 4,165,331, Cl. 260-448.80R.

Wells, John C.; and Back, Paul R., to United Technologies Corporation. Versatile ignition defeat and signal conditioning. 4,165,481, Cl. 324-16.00T.

Welsh, Howard: *See—*
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Wentler, George E.: *See—*
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Werner, Paul: *See—*
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Wessler, Louis E.; Koch, Kenneth F.; and Cleveland, Andrew J., to Xerox Corporation. Video hard copy controller. 4,165,520, Cl. 358-280.000.

Westcott, Lawrence: *See—*
Raine, Paul R.; and Westcott, Lawrence, 4,165,398, Cl. 427-150.000.

Western-Cullen-Hayes, Inc.: *See—*
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Castle, Peter M., 4,165,269, Cl. 204-163.00R.
Knight, Charles B., deceased, 4,165,255, Cl. 176-30.000.
Reyes, Renato D., 4,165,254, Cl. 176-19.00R.

Westvaco Corporation: *See—*
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Whirlpool Corporation: *See—*
Lyman, John B.; and Stewart, Bruce E., 4,165,140, Cl. 339-15.000.

White, Dwain M., to General Electric Company. Acyl capped quinone-coupled polyphenylene oxides. 4,165,422, Cl. 525-397.000.

White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., to Enerco, Inc. Continuous drying and/or heating apparatus. 4,165,216, Cl. 432-102.000.

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Harris, Eugene G.; and White, John F., 4,165,321, Cl. 260-340.200.

Whitener, Philip C., to Boeing Company, The. Tandem wing airplane. 4,165,058, Cl. 244-45.00R.

Whitney, Thomas A.; and Langer, Arthur W., Jr., to Exxon Research & Engineering Co. Asymmetric synthesis via optically active chelating agents. 4,165,330, Cl. 260-448.20B.

Wiegers, Wilheimus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., to International Flavors & Fragrances Inc. Uses of terpene dimers in perfumery processes and products. 4,165,301, Cl. 252-522.000.

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Willard, David C.: *See—*
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Williams, Edward A.: *See—*
Beard, Michael A.; and Williams, Edward A., 4,164,942, Cl. 128-146.500.

Williams, Frank R.; and Abraham, William, to Consolidated Medical Equipment Inc. Locking electrical connector. 4,165,141, Cl. 339-75.00R.

Wilson, John E., to Deere & Company. Rotor for an axial flow rotary separator. 4,164,947, Cl. 130-27.0HA.

Wiman, Robert E.: *See—*
Schlossman, Irwin S.; and Wiman, Robert E., 4,165,303, Cl. 260-22.00D.

Wind, Evert; and de Vletter, Robbert, to N.V. Centrale Suiker Maatschappij. Combined anaerobic reactor and settler. 4,165,285, Cl. 210-195.300.

Winton Corporation: *See—*
Scott, Harold W., 4,164,978, Cl. 166-249.000.

Wiper-Mate, Inc.: *See—*
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Wiskott, Erik: *See—*
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Witt, Paul R., Jr., to Grain Processing Corporation. Torrefied barley for brewer's mashes. 4,165,388, Cl. 426-16.000.

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Wittry, David B., to Rockwell International Corporation. Rotating anode x-ray source and cooling technique therefor. 4,165,472, Cl. 313-35.000.

Wocher, Berthold; Pfitzmaier, Heinz; and Pfendler, Thomas, to Robert Bosch GmbH. Reduction of echoes of irrelevant targets in a vehicle anti-collision radar system. 4,165,511, Cl. 343-7.0VM.

Wolf, Richard: *See—*
Latzina, Kurt; Martin, Hans; and Wolf, Richard, 4,165,203, Cl. 415-113.000.

Wolfinger, Mark D., to Monsanto Company. 3-(Tert-alkylthio)-1,3-thiazolidin-2,4-dione used to inhibit premature vulcanization of diene rubbers. 4,165,417, Cl. 525-3.000.

Works, Madden T., to FIP, S.A. de C.V. Gate valve. 4,165,064, Cl. 251-329.000.

Wright, Clinton M.: *See—*
Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,165,364, Cl. 423-456.000.

Wuerfel, Robert P. Variable displacement arrangement in four cycle, reciprocating, internal combustion engine. 4,164,916, Cl. 123-78.00C.

Wulff, Harald P.: *See—*
Narayan, Thirumurti; Patton, John T., Jr.; Cenker, Moses; and Wulff, Harald P., 4,165,414, Cl. 521-129.000.

Wurzburger, Paul D., deceased; and by Reed, Peter, executor, to Salk Institute for Biological Studies, The. Metering valve. 4,164,959, Cl. 137-553.000.

Xerox Corporation: *See—*
Donohue, James M.; and Mueller, Daniel L., 4,165,170, Cl. 355-14.000.
Wessler, Louis E.; Koch, Kenneth F.; and Cleveland, Andrew J., 4,165,520, Cl. 358-280.000.

Yagi, Naoki: *See—*
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.

Yamada, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, to Sumitomo Chemical Company, Limited. 7-(α-Acylamino-α-phenyl or thienylacetamido) cephalosporin derivatives. 4,165,373, Cl. 424-246.000.

Yamakage, Tetsuro: *See—*
Tsuboi, Akira; and Yamakage, Tetsuro, 4,164,809, Cl. 29-568.000.

Yamanaka, Clarence T., to Garrett Corporation, The. Simultaneous state prevention system. 4,164,894, Cl. 98-1.500.

Yamanaka, Clarence T.: *See—*
Aldrich, Howard P.; Burgess, Glenn A.; and Yamanaka, Clarence T., 4,164,895, Cl. 98-1.500.
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Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, to Kao Soap Co., Ltd. Process for producing lower allergenic lanolin or derivatives thereof. 4,165,327, Cl. 260-397.250.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.

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Yasenak, John P.: *See—*
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Yellin, Tobias O.: *See—*
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Jones, Derrick F.; and Yellin, Tobias O., 4,165,377, Cl. 424-270.000.

Yerkes, John W.; and Avery, James E., to Atlantic Richfield Company. Solar cell with improved printed contact and method of making the same. 4,165,241, Cl. 136-89.0CC.

Yokoyama, Toshiharu: *See*—
Okano, Takeshi; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,165,441, Cl. 585-444.000.

Yorke, Roy E.: *See*—
Affa, Stephen N.; and Yorke, Roy E., 4,165,107, Cl. 285-41.000.

Yoshinaka, Shigeo; Doya, Masaharu; Uchiyama, Seiji; and Nozaki, Sadao, to Mitsubishi Gas Chemical Company, Inc. Process for producing phthaloyl dichlorides of high purity. 4,165,337, Cl. 260-544.00D.

Yoshisato, Akiyuki, to Alps Electric Co., Ltd. Single sideband transceiver. 4,165,486, Cl. 325-17.000.

(Zaidanhojin) Sagami Chemical Research Center: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.

Zanichelli, Gianni, to RACI S.p.A. Collar for gas pipelines. 4,165,111, Cl. 285-419.000.

Zato, Thomas J., to Zenith Radio Corporation. Channel change indication circuit with delayed memory activation. 4,165,489, Cl. 325-464.000.

Zelensky, Georgy A.: *See*—
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Zellweger Uster Ltd.: *See*—
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Zenith Radio Corporation: *See*—
Zato, Thomas J., 4,165,489, Cl. 325-464.000.

Ziegler, William E., to Hoover Universal, Inc. Multiple extrusion head assembly. 4,165,212, Cl. 425-382.00R.

Zielinski, John P. Gas appliance retrofit orifice. 4,165,039, Cl. 239-600.000.

Zimmermann, Carl J.: *See*—
Weber, Roland E.; and Zimmermann, Carl J., 4,165,283, Cl. 210-111.000.

Zubarev, Alexei G.: *See*—
Kostyanoi, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.

Zurawin, Adam; and Ricciuti, Gaetano, to Adams Brush Manufacturing Co., Inc. Paint pan for applying paint to pads and rollers. 4,164,803, Cl. 15-257.050.

Zvenigorodsky, Evgeny I.: *See*—
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,165,135, Cl. 406-152.000.

Zwanziger, Rudolph: *See*—
Strien, Werner; Zwanziger, Rudolph; and Kaufmann, Ernst, 4,165,126, Cl. 297-284.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF AUGUST, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allied Chemical Corporation: *See*—
Tanner, Lee E.; Ray, Ranjan; and Cline, Carl F., Re. 30,080, Cl. 75-175.500.

Atlee, Zed J.; and Kasten, Roy F., Jr., to Picker Corporation. X-ray tube having focusing cup with non-emitting coating. Re. 30,082, Cl. 313-57.000.

Cline, Carl F.: *See*—
Tanner, Lee E.; Ray, Ranjan; and Cline, Carl F., Re. 30,080, Cl. 75-175.500.

Czikk, Alfred M.: *See*—
Kun, Leslie C.; and Czikk, Alfred M., Re. 30,077, Cl. 165-133.000.

Foulkes, Frank R., to Huron Chemicals, Limited. Ion exchange chromate removal. Re. 30,081, Cl. 423-54.000.

General Signal Corporation: *See*—
McEathron, Eugene D., Re. 30,079, Cl. 303-69.000.

Gonos, Michael G.; Ives, Kenneth D.; and Vranka, Ronald S., to United States Steel Corporation. Method and apparatus for locating improperly positioned or bent rolls. Re. 30,075, Cl. 33-143.00L.

Harris Dynamics: *See*—
Harris, Trevor L., Re. 30,078, Cl. 280-236.000.

Harris, Trevor L., to Harris Dynamics. Vehicle with variable speed transmission. Re. 30,078, Cl. 280-236.000.

Huron Chemicals, Limited: *See*—
Foulkes, Frank R., Re. 30,081, Cl. 423-54.000.

Ives, Kenneth D.: *See*—
Gonos, Michael G.; Ives, Kenneth D.; and Vranka, Ronald S., Re. 30,075, Cl. 33-143.00L.

Kasten, Roy F., Jr.: *See*—
Atlee, Zed J.; and Kasten, Roy F., Jr., Re. 30,082, Cl. 313-57.000.

Kun, Leslie C.; and Czikk, Alfred M., to Union Carbide Corporation. Surface for boiling liquids. Re. 30,077, Cl. 165-133.000.

McEathron, Eugene D., to General Signal Corporation. Fluid brake control system. Re. 30,079, Cl. 303-69.000.

Picker Corporation: *See*—
Atlee, Zed J.; and Kasten, Roy F., Jr., Re. 30,082, Cl. 313-57.000.

Ray, Ranjan: *See*—
Tanner, Lee E.; Ray, Ranjan; and Cline, Carl F., Re. 30,080, Cl. 75-175.500.

Singer Company, The: *See*—
Thornbery, James M., Re. 30,076, Cl. 137-625.290.

Tanner, Lee E.; Ray, Ranjan; and Cline, Carl F., to Allied Chemical Corporation. Titanium-beryllium base amorphous alloys. Re. 30,080, Cl. 75-175.500.

Thornbery, James M., to Singer Company, The. Four-way reversing valve with differential area operator. Re. 30,076, Cl. 137-625.290.

Union Carbide Corporation: *See*—
Kun, Leslie C.; and Czikk, Alfred M., Re. 30,077, Cl. 165-133.000.

United States Steel Corporation: *See*—
Gonos, Michael G.; Ives, Kenneth D.; and Vranka, Ronald S., Re. 30,075, Cl. 33-143.00L.

Vranka, Ronald S.: *See*—
Gonos, Michael G.; Ives, Kenneth D.; and Vranka, Ronald S., Re. 30,075, Cl. 33-143.00L.

LIST OF PLANT PATENTEES

Berggren, Lars, to Jackson & Perkins Co. Rose plant—Gabriella. 4,452, 8-21-79, Cl. 28.000.

Daniel, William H., to Purdue Research Foundation. Distinct variety of bluegrass plant. 4,453, 8-21-79, Cl. 88.000.

Hilltop Orchards & Nurseries, Inc.: *See*—
Hughes, J. Wilson, 4,451, Cl. 43.000.

Hughes, J. Wilson, to Hilltop Orchards & Nurseries, Inc. Peach tree WH215. 4,451, 8-21-79, Cl. 43.000.

Jackson & Perkins Co.: *See*—
Berggren, Lars, 4,452, Cl. 28.000.

Moore, Ralph S. Miniature rose plant. 4,454, 8-21-79, Cl. 10.000.

Purdue Research Foundation: *See*—
Daniel, William H., 4,453, Cl. 88.000.

LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Seki, Yasusuke; and Abe, Takeshi, 252,684, Cl. D14-72.000.

AGFA-Gevaert, A.G.: *See*—
Schlagheck, Norbert; and Schultes, Herbert, 252,687, Cl. D16-31.000.

Ahn, Chong T. Music box. 252,688, 8-21-79, Cl. D17-24.000.

Aldrich, Thomas B., III, to Procter & Gamble Company, The. Bottle. 252,672, 8-21-79, Cl. D9-137.000.

Andersen, David C.: *See*—
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.

Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., to Artec International Corporation. Typewriter for word processor. 252,689, 8-21-79, Cl. D18-2.000.

Armistead, John A., to Polyphase Corporation. Subterranean water drain. 252,702, 8-21-79, Cl. D23-40.000.

Artec International Corporation: *See*—
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.

Beeman, Everett C., to Monsanto Company. Bottle or similar article. 252,670, 8-21-79, Cl. D9-116.000.

Beeman, Everett C., to Monsanto Company. Bottle or similar article. 252,673, 8-21-79, Cl. D9-143.000.

Beeman, Everett C. Combined bottle and closure therefor or similar article. 252,674, 8-21-79, Cl. D9-144.000.

Bergh, Magnhild L., to Strouse, Adler Company, The. Body briefer. 252,656, 8-21-79, Cl. D2-3.000.

Berglund, Sidney J.; and Goff, Dewain R., to Minnesota Mining and Manufacturing Company. Electrical connector. 252,682, 8-21-79, Cl. D13-24.000.

Besnard, Joel. Inhaler. 252,707, 8-21-79, Cl. D24-62.000.

Boldt, Melvin H.; Morrison, Thurber H.; and Greb, Francis J., to National Presto Industries, Inc. Electric mini-oven with removable cover. 252,665, 8-21-79, Cl. D7-126.000.

Bounds, William E. Combined cheese grater and container. 252,662, 8-21-79, Cl. D7-47.000.

Bowman, Vincent G., to Doerner Products Co. Limited. Swivel posture chair control. 252,661, 8-21-79, Cl. D6-191.000.

Bradley, Arthur S. Golf tee. 252,712, 8-21-79, Cl. D21-208.000.

Brawner, William H., to H.P.G. IV, Inc. Skateboard truck. 252,693, 8-21-79, Cl. D21-226.000.

Brickman, Harold. Portable foldable bar. 252,659, 8-21-79, Cl. D6-144.000.

Caldwell, Jerry L. Valve core. 252,701, 8-21-79, Cl. D23-19.000.

Cole, David M. Small arms storage container. 252,715, 8-21-79, Cl. D3-78.000.

Connolly, John P.: *See*—
Sheehan, Edward P.; Connolly, John P.; and King, James B., 252,683, Cl. D14-40.000.

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Young, Fred C., 252,700, Cl. D22-28.000.
Corini, Louis J., to Fogel Commercial Regrigerator Company. Portable insulated food chest or the like. 252,663, 8-21-79, Cl. D7-77.000.
Cupit, George M. Pipe flashing. 252,703, 8-21-79, Cl. D23-42.000.
Current, Wayne A., to Singer Company, The. Control console. 252,681, 8-21-79, Cl. D13-12.000.
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Fessler, Herman S., to McLean Engineering Midwest. Electric air conditioner for electronic enclosures. 252,705, 8-21-79, Cl. D23-144.000.
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Corini, Louis J., 252,663, Cl. D7-77.000.
Gillette Company, The: *See—*
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Hall, George W., to Don Hall Company. Barbecue grill body. 252,664, 8-21-79, Cl. D7-109.000.
Hitachi, Ltd.: *See—*
Seki, Yasusuke; and Abe, Takeshi, 252,684, Cl. D14-72.000.
Jackson, Harris C. Fishing jig. 252,698, 8-21-79, Cl. D22-27.000.
Jackson, R. Kelley. Golf cart trailer. 252,678, 8-21-79, Cl. D12-101.000.
Johnson, Richard E.: *See—*
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.
Johnston, Duane K. Evaporative cooler pump. 252,685, 8-21-79, Cl. D15-7.000.
King, James B.: *See—*
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Kingsley, Michael C.; and Kingsley, Richard J. Exterior visor for vehicles. 252,680, 8-21-79, Cl. D12-191.000.
Kingsley, Richard J.: *See—*
Kingsley, Michael C.; and Kingsley, Richard J., 252,680, Cl. D12-191.000.
Kramer, Thomas J.: *See—*
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Kressin, Richard H. Portable seat. 252,658, 8-21-79, Cl. D6-41.000.
Lerner, Lawrence; and Schmitt, Fred, to Litton Business Systems, Inc. Desk. 252,660, 8-21-79, Cl. D6-161.000.
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Malm, Curtis L.; and Zierhut, Clarence, to Gillette Company, The. Writing instrument. 252,691, 8-21-79, Cl. D19-51.000.
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Munz, Ethiel L. Cartridge belt. 252,695, 8-21-79, Cl. D22-14.000.
Mushkin, Nicholas M. Switch for killing insects. 252,696, 8-21-79. Cl. D22-20.000.
Muttart, Vincent H., to Spring Crest Company. Floor pulley cord lock. 252,667, 8-21-79, Cl. D8-360.000.
Muttart, Vincent H., to Spring Crest Company. Track stirrup. 252,669, 8-21-79, Cl. D8-380.000.
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Petrisco, Joseph. Simulative toy vehicle. 252,692, 8-21-79, Cl. D21-128.000.
Pharmer, David D.: *See—*
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Procter & Gamble Company, The: *See—*
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Read, Ian R., to Nordic Saunas Limited. Bathtub. 252,704, 8-21-79, Cl. D23-55.000.
Richardson, Sam M., III. Truck bed liner. 252,677, 8-21-79, Cl. D12-98.000.
Rudinski, Robert S. Drapery rod. 252,668, 8-21-79, Cl. D8-377.000.
Sakamoto, Masaharu, to Matsuzaka Iron Works, Inc. Vinyl pipe cutter. 252,666, 8-21-79, Cl. D8-60.000.
Schiermeier, Theodore L. One piece handgun grip or similar article. 252,694, 8-21-79, Cl. D22-1.000.
Schimanski, Georg, to Globol-Werk GmbH. Dispenser for air treating material. 252,706, 8-21-79, Cl. D23-150.000.
Schlagheck, Norbert; and Schultes, Herbert, to AGFA-Gevaert, A.G. Copying machine. 252,687, 8-21-79, Cl. D16-31.000.
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Viering, Rudolf, to Pixyfoto GmbH. Transportable camera. 252,686, 8-21-79, Cl. D16-02.000.
Vincent, Clarence K. Go-cart guard rail. 252,708, 8-21-79, Cl. D25-38.000.
Weiss, Gary D. Chess board. 252,713, 8-21-79, Cl. D21-24.000.
Welden, Ronald L.; and Short, Richard L., to Welden, Ronald L. Air deflector. 252,679, 8-21-79, Cl. D12-181.000.
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White, David L.; and White, Beverly A., 252,711, Cl. D21-17.000.
White, David L.; and White, Beverly A. Base member for parlor game. 252,711, 8-21-79, Cl. D21-17.000.
Wong, Hon Wai. Combined horological and writing instrument. 252,690, 8-21-79, Cl. D19-36.000.
Young, Fred C., to Cordell Tackle, Inc. Fishing lure. 252,700, 8-21-79, Cl. D22-28.000.
Young, Helen, to N A S Import Corp. Handle for a handbag. 252,657, 8-21-79, Cl. D3-54.000.
Zierhut, Clarence: *See—*
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4,165,223	4,164,950	4,165,291	4,165,380	4,164,977	4,165,497
4,165,238	4,164,959	41 : Re.30,082	4,165,412	4,164,979	52 : 4,165,067
4,165,247	4,165,032	4,164,795	4,165,413	4,164,980	53 : 4,164,826
4,165,270	4,165,065	4,164,802	4,165,425	4,165,064	4,164,878
4,165,332	4,165,109	4,165,008	4,165,426	4,165,133	4,164,930
4,165,351	4,165,125	4,165,074	4,165,443	4,165,198	4,165,058
4,165,391	4,165,215	4,165,526	4,165,476	4,165,244	4,165,161
4,165,395	4,165,221	42 : Re.30,075	4,165,527	4,165,248	4,165,205
4,165,422	4,165,242	4,164,796	43 : 4,165,124	4,165,259	4,165,399
4,165,439	4,165,290	4,164,849	44 : 4,164,887	4,165,263	4,165,483
4,165,442	4,165,299	4,164,853	45 : 4,164,794	4,165,272	54 : 4,165,345
4,165,478	4,165,300	4,164,946	4,164,840	4,165,364	55 : Re.30,076
4,165,490	4,165,303	4,164,951	4,164,841	4,165,440	4,164,808
4,165,494	4,165,310	4,165,097	4,165,056	4,165,474	4,164,810
4,165,517	4,165,321	4,165,146	4,165,280	4,165,504	4,164,833
4,165,529	4,165,333	4,165,156	4,165,288	4,165,522	4,164,864
4,165,537	4,165,334	4,165,199	46 : 4,165,118	49 : 4,164,834	4,164,965
4,165,539	4,165,347	4,165,216	47 : 4,165,007	4,165,041	4,164,983
37 : 4,164,798	4,165,356	4,165,227	4,165,034	4,165,088	4,165,044
4,164,804	4,165,382	4,165,254	4,165,271	4,165,192	4,165,102
4,164,839	4,165,420	4,165,258	48 : 4,164,799	50 : 4,164,851	4,165,103
4,165,037	4,165,534	4,165,269	4,164,862	51 : 4,164,931	4,165,138
4,165,505	40 : 4,164,832	4,165,304	4,164,886	4,165,012	4,165,160
39 : 4,164,879	4,164,871	4,165,318	4,164,934	4,165,020	

DESIGN PATENTS

4 : 252,685	252,688	09 : 252,656	26 : 252,711	252,660	252,676
5 : 252,677	252,689	252,670	27 : 252,682	252,672	252,701
6 : 252,709	252,692	16 : 252,694	252,705	252,707	252,708
9 : 252,673	252,693	17 : 252,659	31 : 252,664	37 : 252,702	252,714
252,674	252,695	252,665	32 : 252,696	39 : 252,671	51 : 252,715
06 : 252,662	252,698	18 : 252,668	34 : 252,681	42 : 252,663	53 : 252,680
252,667	252,713	25 : 252,683	252,710	47 : 252,700	252,699
252,669	08 : 252,678	252,691	36 : 252,657	48 : 252,675	55 : 252,712
252,679					

PLANT PATENTS

06 : 4,454	18 : 4,453	34 : 4,451			

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